PENSACOLA
HARBOR & BAR

SURVEYED IN 1822

by

MAJOR JAMES KEARNEY U.S.T.E.

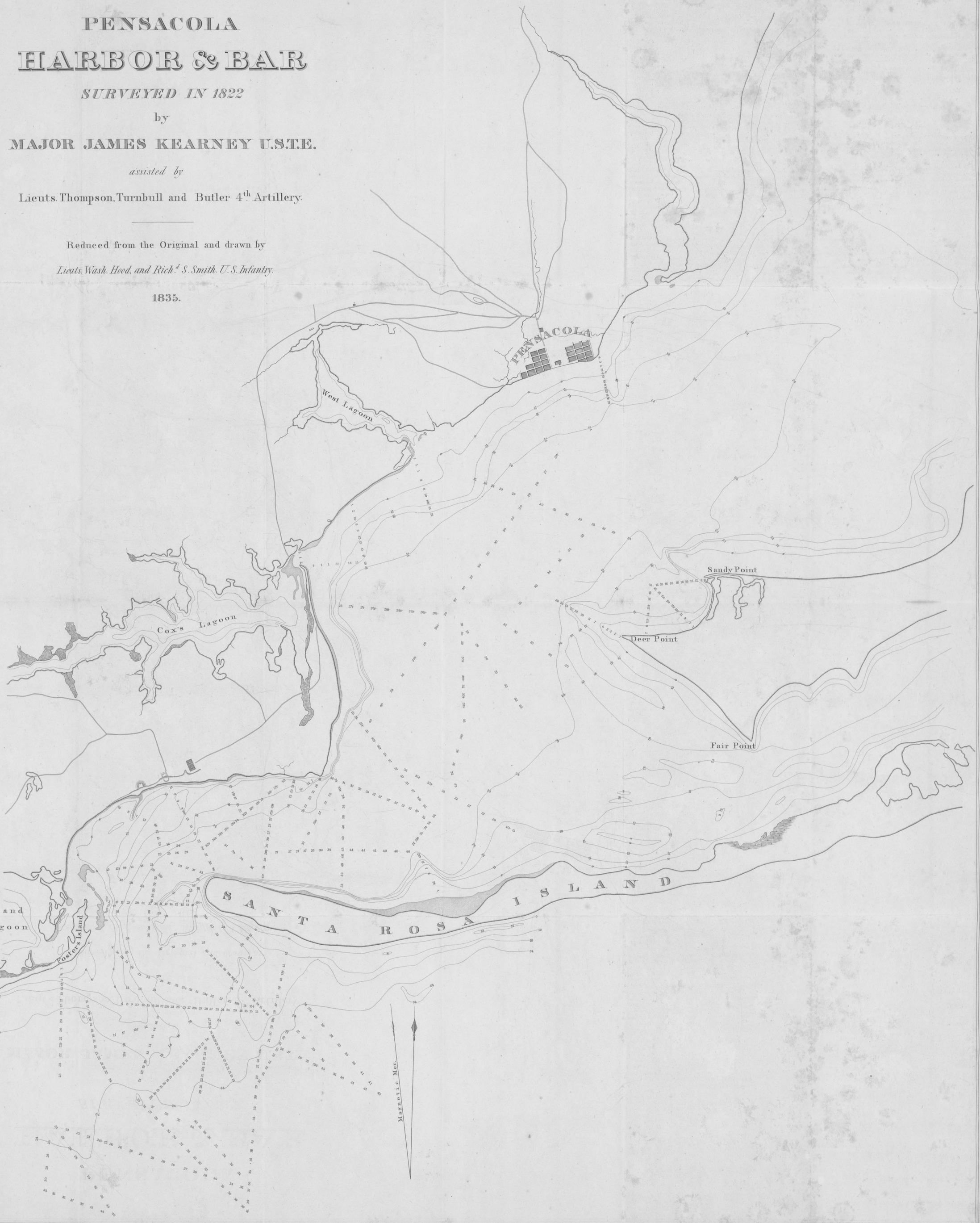
assisted by

Lieuts. Thompson, Turnbull and Butler 4th Artillery.

Reduced from the Original and drawn by

Lieuts. Wash. Hood, and Rich.d S. Smith. U.S. Infantry.

1835.



23d Congress, 2d Session. [Doc. No. 8.] Ho. of Reps. Executive.

CANAL ROUTES—FLORIDA.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

TRANSMITTING

A Report and Maps of a Survey of Canal Routes through Florida.

December 9, 1833.—Referred to the Committee on Roads and Canals.
December 4, 1834.—Reprinted by order of the House of Representatives.

Washington, *December* 6, 1833.

To the House of Representatives:

I transmit herewith, for the information of the House, the report of the survey made in pursuance of the 4th section of the act of Congress of the 4th July, 1832, authorizing "the survey of canal routes in the Territory of Florida."

ANDREW JACKSON.

War Department, *December* 4, 1833.

Sir: I have the honor to transmit, herewith, copies of the report and maps of a survey made under direction of the Topographical Bureau, in pursuance of the 4th section of the act of Congress of 4th July, 1832, authorizing "the survey of canal routes in the Territory of Florida."

Very respectfully,
Your most obedient servant,
LEW. CASS.

The President *of the United States.*

Copy of a report of a survey between Mobile and Pensacola bays. with reconnoissance between Choctawhatchie river and St. Andrew's bay.

Washington City, 14*th October*, 1833.

Lieut. Col. J. J. Abert,
U. S. Topographical Engineer:

Sir: By a letter received from the Topographical Bureau, dated January 8, 1833, I was directed to proceed to Mobile, Alabama, for the pur-

[Gales & Seaton, print.]

pose of taking the immediate direction of a survey for a canal to connect the bay of Mobile with that of Pensacola.

Lieuts. J. F. Drayton, of the infantry, T. J. Lee, G. W. Ward, and H. G. Sill, of the artillery, having been ordered to report to me for that object, I proceeded immediately to carry into effect the order. Having, as far as practicable, accomplished the duties of the survey, and the maps and drawings relating thereto being completed, I have the honor to report the result of my examination.

There is obviously but one route for a canal, to be considered in reference to the debouch of the project on the bay of Mobile. This is Bon Secour river: to which my instructions, as predicated upon the reconnoissance of the Board of Internal Improvements, particularly refer. The exact point upon the river Bon Secour, where the canal shall terminate, however, becomes a matter of selection, founded on the results which I am about to submit.

I will, in the first place, offer a view of the project, divested of topographical detail, for the sake of perspicuity.

The proposed canal may be regarded as a prolongation of the project to connect the Mississippi with the bay of Mobile, or as an independent project, having its initial point in the bay just referred to: in either case, the route would proceed as follows: Up the bay of Bon Secour to the river of that name; thence through a channel to be excavated over the bar at its mouth, and ascending afterwards for some distance by the natural channel of the river. From some point to be hereafter designated above the bar of Bon Secour river, the canal should be conducted by a thorough cut, in an easterly direction, to a point above the mouth of Bear creek, a tributary of the bay Lalande, which falls into the Perdido river; descending the creek, which requires improvement to render it navigable, it traverses bay Lalande, and ascends or descends the Perdido, as the upper or lower route may be adopted, to the point on the eastern side, where excavation for the canal shall recommence, and thence, by a thorough cut, or otherwise, according to the route chosen, connect the Perdido with Pensacola bay.

I now proceed to the details of the survey, and, first, the examination of Bon Secour river. The bar at its mouth is the first obstacle to be overcome; it is formed there, in consequence of this portion of the river being less under the influence of the current than those parts of the river above, where the volume of water is confined to a narrow channel, and possesses a greater velocity. The river suddenly spreads out at this point, and the alluvions brought down by the stream are deposited, the current being too feeble to hold them longer in suspension. No artificial current can be formed to remove the bar without great expense, the river being very wide, and the deepest water situated about the middle of it. Any means that might be resorted to, to restrain the waters of the high tides, to be discharged at the ebb, would involve very expensive constructions; besides which, there is not a sufficient difference between high and low tides, to furnish a head of water to give a velocity adequate to the required effect, even if a system of sluice gates were adopted. The greatest observed difference at the bar, during the time we were enabled to confine our investigations to this portion of the survey, did not exceed 18 inches.

To merely dredge a channel at the bar, without fortifying it with a jettee, would be entirely inefficacious, as the primitive cause would continue to exist, and perpetually renew the obstruction.

The plan that appears to me the most eligible, to ameliorate this obstacle, both on the score of simplicity and the nature of materials to be employed, consists in forming, by the dredging machine, a channel through the bar, to the depth of 8 feet, and protecting its whole development by two parallel jettees or piers.

The channel through the piers should be 100 feet in width, in order that vessels might make it with facility in bad weather, and run no risk of concussion against the sides of the piers; also, that the accumulation of sand which usually takes place at the base of any construction in the water, may not readily extend to the centre of the channel, and obstruct the navigation. The right line upon which the jettee is placed, will be made to diverge somewhat from the axis of the stream, and by that means the alluvion will be diverted in a measure from the channel excavated. In determining upon the depth which should be assumed for the projected canal, I have regarded the principle of conformity with the project referred to by the Board of Internal Improvements, and have assumed that the largest boats destined to navigate the canal will have 36 feet cross section, with a length of 120 feet. Great stress is laid upon the advantage of this conformity of parts, in every system of navigation, by the best European engineers, as derived from a knowledge founded on long experience of the evil effects of a contrary practice.

I have, however, been compelled to modify my plan according to the nature of its locality, and it is this which had induced me to deviate in a slight degree in reference to the depth assumed for the project. In every other particular, I have made it conform rigorously to the system previously devised. The report of the Board of Internal Improvements refers to a canal of 8 feet in depth, between New Orleans and Mobile bay. I approach to this plan as nearly as possible, consistently with the nature of circumstances, in giving the canal under discussion a depth of 7.5 feet. This depth also coincides with that found upon the natural channels, which must enter into the system of navigation, viz. the Rigolets and Chef Menteur, &c.

If stone could be easily procured in this vicinity, it would probably be found expedient to fill up the piers with that material. But I have gone into an estimate upon that hypothesis, and find that the expense for the piers alone would be too considerable to admit of its adoption. Refuse brick or indurated clay, in masses, would be cheaper. But even here the expense for the piers, exclusive of the dredging, would amount to 277,301 dollars. In this estimate, I have assumed the price of refuse brick at less than half the cost of common brick, deduced from the analysis of prices for that vicinity; the dimensions of the piers, at the same time, being regarded at their minimum, so far as may be consistent with stability and reasonable duration. The advantages of erecting a work of this character would consist in this, that the massive would remain independent of the wood work, which should serve to protect it, during and for a certain period after its construction. If a wharf should be thought necessary, it would have to be constructed, in reference to economy, by means of a wooden encaissement, formed by large logs, laid horizontally in the plane of its perimeter, with piles of 30 feet in length, at intervals of 10 feet

throughout its development; that is, four times the length of the channel, plus four times the breadth of the piers, equal to 23,040 feet. This would have to be filled in with clay at very great expense, as the materials taken from the channel would possess too little tenacity to be retained in an encaissement so constructed.

The necessary securing and tie pieces, with excavation to bring the foundation at least as low as the bottom of the channel, would cost, by a very minute estimate, $121,452, without involving contingencies.

The simplest manner of constructing the general plan referred to, is by means of pile planks, with joints carefully worked, so as to prevent the loose materials taken from the channel from percolating. These are rendered firm by being attached to piles of thirty feet long, driven at intervals of four feet upon the whole development. The heads of the pile planks to rise only four feet from the profile of the bar. They will, by this means, be entirely below the surface of the water, and thus avoid the shock of the waves. The piles rising three or four feet above the surface of the water, dependent on the depth to which it may be found necessary to drive them, will serve as guides to the channel. This, however simple it may appear at first sight, I feel confident, will answer the purpose proposed, and may be constructed at much less expense than either of the plans previously suggested.

A pier head for the purpose of a light-house is included in the estimate. A simple arrangement of light may serve to illuminate the heads of the piles during the night, as they conform, upon the whole development, to a right line.

The details are as follows:

Jettee at mouth of Bon Secour river.

1,412	piles of good timber, with incidental work, to receive the wood work in connexion, driven, at $4 80 - - - -	$6,777	
5,750	pile planks, tongued and grooved, with incidental work, complete, at $2 93 - -	16,847	
11,500	feet of timber, 6 inches by 6 inches, with incidental work, complete - - -	4,140	
11,500	feet of timber, 4 inches by 6 inches, with incidental work, complete - - -	2,760	
			$30,524 00
	Wood work for pier head, constructed as above, development 60 feet - - - -	$318	
225	feet 3 inch plank, with securing and tie pieces -	180	
			498 00
	Cost of one jettee, with pier head - - -		31,022 00
	Do. do. without pier head - -		30,524 00
	Whole cost of construction of wood work - -		61,546 00
	Excavation for channel 57,778 cubic yards - -		14,444 00
			$75,990 00

This obstruction being remedied so far as may be consistent with a reasonable expense, it must not be disguised, that attention, with an occasional moderate expense, will be requisite to prevent the further deposition of alluvions. Experience has sufficiently proved that obstructions of this kind are not entirely to be obviated by any expense in harmony with the nature of the present project. Above the bar there is a natural channel in the river for a distance of 5,000 feet, to a point marked A on the map relating to the survey. Here the depth decreases so as to render it necessary to excavate; but the obstacles are of a character quite different from the one just alluded to. They are occasioned by casual circumstances, and are simply accumulations of mud and sand around some accidental deposition. Oyster banks, also, frequently obstruct the channel of the river, and serve as a nucleus to the alluvions. These, on being removed, will not, I think, recur, by applying proper attention, with the necessary current expenses for the support of the work, after completion.

The point denoted by A on the map is that from which several experimental lines, surveyed from Bon Secour river to the head waters of the Perdido, diverge. The channel thus far is wide and deep, and would require no improvement whatever; the shores are wide apart during this portion, and are of a low, swampy character on both sides; the water is shoal to a considerable distance from the land on either side.

I will now refer to the experimental line for the canal, which seems to me to offer the greatest advantages as the line of location. It is denoted on the map as No. 4.

Assuming the canal to debouch at the east side of the inlet to bay John, and shown on the map at B, I propose that a jettee extend from this point to deep water; by reference to our project of navigation, this will be a distance of 2,960 feet. The jettee will be composed of an encaissement of wood, and filled in with clay; this material being found in the neighborhood of Bon Secour river. A channel 70 feet wide will be dredged upon this distance 69,684 cubic yards. At the extremity, a fine natural basin, having a very considerable area of deep water, exists, which is an advantage that would have to be purchased to the other experimental lines at great expense of excavation and wood work, and would then be comparatively limited in capacity. This, as affording an accommodation of serious importance to inland navigation, I have thought it worthy of some sacrifice of economy to obtain. Divested however of this construction, the line of location at present under discussion would have equal advantages in point of commodious navigation, and would then be less expensive than the others, to be hereafter noticed. The breadth of the wharf would be 10 feet, and height 12 feet, estimated from the upper surface to the bottom of the channel. I give it this height in order that it may be above the highest waters occasioned by the prevalence of southerly and westerly winds, which often occasion a very great rise of tide over its ordinary level. The upper surface of this jettee is carried on until it intersects the natural ground, by which means a guard dyke of great expense may be dispensed with; the outer surface of this embankment will be guarantied from abrasion by fascines. The inner surface, after the mass of the jettee intersects the natural ground to the lock, will be secured by an abutment of timber, as the nature of the ground does not admit of trusting to the natural slope as an embankment. This revetement of wood will be the most economical, and at the same time the most efficient in protecting the sides against abrasion.

Estimate for jettee at debouch of line No. 4.

Excavation for channel and foundation of jettee, bic yards - - - - -	69,684 cu.	$13,936
1,980 wharf logs, 30 feet long, 14 in. diameter, with incidental work for securing ties, &c. -	7,920	
594 piles, 30 feet long, 14 inches diameter, driven, with incidental work - - -	2,228	
2,960 securing ties, work applied - - -	8,880	
296 do. do. - - -	1,184	
String pieces for development of the pier - -	594	
Filling in brush upon area, 23,680 feet - -	307	
29,600 three inch planks - - - -	2,368	
		23,481
Embankment in pier with clay, 13,155 cubic yards	-	6,577
Cost of one pier,	- -	43,994
Do. of two piers,	- -	$87,988

I shall now refer to the nature of ground, and other details relating to the location of line No. 4, from the termination of the jettee on Bon Secour river to its debouch on Bear creek, the head of navigation, in respect to the waters of Perdido river.

The line upon which the canal is drawn on the map does not coincide with any line levelled between the point (B) at bench mark IV, a distance of 11,620 feet; but it lies between the contiguous lines No. V and No. III, both of which were levelled, and the intermediate ground is fully known by reconnoissance. The slope is perfectly uniform, as shown by the harmony existing between the two levels referred to, presenting similar figures, with a very slight difference in their ordinates above the plane of comparison: so that, taking a mean between the two profiles, 3 and 5, we approximate very nearly to the truth as regards No. 4.

The ground on this distance, in common with each of the other lines, is very low and swampy, intersected with a thick growth of cypress, which will require expensive grubbing to prepare it for excavation. The soil is a thin mud, mixed with sand, and difficult of removal. In my estimate, I have involved these incidental expenses throughout in the item of excavation. The ground on this line is generally level and low, the mean ordinate above the plane of comparison being 7.819 feet, and 18.519 feet above the bottom of the canal; the latter being assumed at 7.5 feet below the lowest estimated plane of tide in the Bon Secour river. By this means no delay can ever take place in the passage of boats, as might happen in any hypothesis based upon a lighter excavation.

The lowest tides were estimated, from the best information to be procured, at 1.5 feet below the plane of mean low water, which we found to be 1.7 feet below the plane of comparison assumed at ordinary high water level. Should it be thought that the expense of excavation of this prism of 1.5 feet would be more than commensurate with the evil of delay, in case the water by strong northerly winds should be reduced below its ordinary level of low tide, it may be rejected, from the amount of the cost of the work, (it amounts to $49,869) If a different value be given to the depth

than 1.5 feet, the formula for any value whatever will be $\frac{35624 \times 70}{27} \times x$, in which x is the variable. The results will be the number of cubic yards that may be added or deducted from the whole amount of estimate for this line, in the degree that x is considered greater or less than 1.5, for which I have estimated. 35624 is the whole length of line from point A to the lock on Bear creek, inclusive, the extra excavation for the foundation of the jettee being considered; its area being resolved into a parallelogram having 70 feet for one side, the other being added to make up the length above stated.

The guard and regulating lock on the western extremity will be placed at the point where the upper surface of the jettee intersects the natural ground, and the side walls of the lock will be in the same horizontal plane; they will, therefore, be 12 feet high, the breadth of chamber 38 feet at bottom, and 40 feet at top; there will be three pairs of gates, with the necessary details for regulating the prism of water in the passage of boats. The side walls will have a thickness of 4 feet at top and 8 feet at bottom, and are to be constructed of brick masonry. Stone will only be used in those parts where there is some impinging force on a small surface, too great to be sustained by brick work. A certain portion, however, will be requisite for the hollow quoins, mitre sills, &c. The additional pair of gates will afford the means of repairs in cases of accident, and could scarcely be dispensed with under the circumstances supposed to exist in reference to the area at the gates, and the pressure of water due to a height of 12 feet. The sides of the canal will be faced with wood, as the cheapest revetement of any efficacy in this vicinity, and the most to be relied on to prevent the sides from percolating or encumbering the canal. The natural ground of loose sand is of too subtle a character to be depended on without a continuous revetement, carried even below the plane at the bottom of the canal. There will be four recesses between the locks at the extremities of this line, with an area of 1,613 square yards. This conforms with the plan suggested by the Board of Internal Improvements for the Pontchartrain canal, although, for the sake of economy, I have diminished the number one-half, as it is probable that the boats navigating will rarely be of such dimensions as to be unable to pass each other on the trunk of the canal; also the cut conforming very nearly to a right line, and the ground being sufficiently level to admit of distant observation, I have thought it inexpedient to multiply their number, regarding it as an item of expense without a commensurate benefit. There will be on each side of the canal, at the foot of the embankment, a ditch parallel to the whole development; it will have a mean section of 12 square feet, and will have a slope of four inches to one mile, from the centre to the extremes of the line. These back drains will not require tide gates, as the outer embankment of the canal will be protected with fascines, or below the curve where the plane of highest floods intersects the natural surface of ground.

The face of the country is entirely destitute of cultivation, not only in this part, but generally where our survey has been conducted; the soil is of loose sand and mud, possessing scarcely any tenacity, and, in its newly excavated state, would be acted on by the slightest agitation of water in contiguity with it.

The growth of timber consists of yellow pine, interspersed with cypress swamps, and the country is very sparsely inhabited within a distance of twenty-five miles, Pensacola being the nearest settlement of consequence.

The details of expense in reference to this line are as follows :

Estimate for line No. 4.

Excavation of sand and mud, 7,842 cubic yards, -		$2,823
Coffer dam constructed with sheet piling with heavy piles, 4 feet interval, development 220 feet, -	$1,386	
Securing pieces at top and bottom, with guiding frames, - - - - - -	462	
Embankment in coffer dam, - - -	233	
		2,081
Wood work on sides of canals, intermediate between jettee and lock, development 50 feet, - -	1,090	
Fascine work for out development of the embankment, - - - - - -	133	
		1,223
Excavation for lock, sand, and mud, 12,700 cubic yds.	3,810	
Driving piles for the coffer dam to secure the foundation, - - - - - -	1,700	
Platform to receive the lock, - - -	6,912	
Embankment behind the walls of lock, 3,000 cubic yards, - - - - - -	690	
Brick masonry for side walls and bottom, 3,825 cubic yards, - - - - -	49,725	
Three pairs of gates, - - - -	5,311	
Stone work and hollow quoins, mitre sills, &c. -	3,784	
		71,932
Excavation on trunk of canal to B. M. IV, 412,104 cubic yards, - - - - -	148,357	
One recess at B. M. IV, 10,161 cubic yards, -	3,658	
One do. between Bon Secour and B. M. IV, 8,070 cubic yards, - - - - -	2,824	
Wood work to B. M. IV, on development, 22,985 ft.	50,107	
		204,946
Excavation from B. M. IV to lock on Bear creek, 1,079,198 cubic yards, - - - -	377,719	
Two recesses intermediate between lock on Bear creek and B. M. IV, 22,416 cubic yards, -	7,621	
Facing with wood on development, 40,645 feet, -	88,606	
Back drain excavation, 28,284 cubic yards, -	8,485	
		482,431
Excavation for lock on Bear creek 16,333 cubic yards, - - - - - - -	4,899	
Coffer dam around the foundation, - - -	1,700	
Embankment behind side walls after the completion, 4,451 cubic yards, - - - - -	1,023	
Masonry for side walls and bottom of lock, 3,020 cubic yards, - - - - - -	48,100	
Three pairs of gates, with water gates, - -	5,000	
Stone work for mitre sills, hollow quoins, &c. -	3,660	
Coffer at extremity of work, - - -	1,800	
		66,782
Draining during excavation of work, - -		17,960

Cost of canal from termination of jettee on Bon Secour river to lock on Bear creek inclusive, - - -	849,578
Cost of jettee brought forward, - - - -	87,988
Whole cost of this location, - - -	$937,566

If it should be thought expedient to have a basin at the lock on Bear creek, it would involve an additional excavation of 92,592 cubic yards, and a development of wood work of 860 feet extra, supposing it to contain a superficial area of 250,000 feet. Its cost would amount to 35,225 dollars. It would form a common item of expense in the several experimental lines estimated. As it does not however appear to me absolutely necessary, I have thought it advisable to refer to it as above, without allowing it to enter as an item in the general estimate. If an increase of traffic on the canal should render its convenience commensurate with the expense of construction, it could be executed, without prejudice to the operation of the trade, at any future period.

I now proceed to the several experimental lines surveyed, in order to show their relative fitness for the object proposed, and to compare them with the project already discussed, which I have presumed to recommend as the most eligible route.

From the point denoted on the map by A, a line was examined which should have its debouch on the north and east extremity of bay John, at a point denoted on the map by C.

From A to this point excavation will be necessary; it will commence at A, and be effected upon the bar which lies in the opening of the channel into bay John; there is afterwards sufficient water in the channel as far as the jettee, which will be requisite at the debouch of the canal. This excavation will not, I think, require jettees to protect the channel; but, when once effected, will cease thenceforward, with the usual attention and expense in such cases, to be an obstruction. A jettee of 350 feet in length will be requisite to reach the deep water, and to serve as a wharf to accommodate the trade. The ground at this debouch is very low and swampy, and I have therefore thought it advisable to carry the upper surface of the jettee, which is in a horizontal plane 12 feet above the bottom of the canal, to its intersection with the natural surface of the ground. This will take place at a considerable distance from the debouch on the Bon Secour. By this plan, however, extensive guard dykes will be dispensed with, as also a gate at the extremity of the back drain.

The jettee is upon the same plan as that for which I have estimated at the mouth of bay John, line No. 4. The lock being placed at the intersection just referred to, will have the same elevation, that is, 12 feet, which will be, as before stated, above the reach of the highest waters. It will be in every respect like that already estimated for. It may be here remarked, that if we should hypothecate at this debouch a wharf possessing the same efficient properties as that estimated for in the line recommended, with a basin, although insignificant in capacity when compared with the natural one secured to the latter at the point A, the expense of this line would be increased in a ratio that would render it inexpedient, even on the score of economy, its present recommendation.

The ground upon this location is lower than that of the one already discussed, but at the same time is of a more wet and inauspicious charac-

ter in reference to excavation. The distance from Bon Secour to the lock on Bear creek inclusive, is 30,930 feet, which is 890 feet less than the distance on the location recommended. The plan of a canal is similar to that above stated. Some slight modification was requisite, by reason of the curved line of its development. The lock on the extremity, at Bear creek, is common to the other lines, and has been already noticed.

The estimate for details on this route is as follows:

Estimate for line No. 5.

From point A to jettee on bay John, excavation by dredging 14,455 cubic yards, . . .		$3,613
Jettee 350 feet long, same as estimated for at debouch of line 4, wood work, . . .	5,250	
Filling in with clay 6,960 cubic yards, . .	3,480	
Extra excavation for foundation of jettee, 518 cubic yards, ...	129	
		8,859
Excavation between jettee and lock, 176,755 cubic yards,	58,328	
Fascine work on external area of embankment, .	1,700	
		60,028
Excavation 12,666 cubic yards for lock, . .	3,786	
Coffer dam, with piles and grooved planks, .	752	
Filling in with clay for coffer dam, . .	222	
Coffer dam around foundation of lock, . .	1,700	
Platform of wood work for lock, . . .	6,912	
Filling in behind the walls of lock, after its completion, 3,000 cubic yards, . . .	690	
Brick masonry for the side walls and bottom of lock, 3,825 cubic yards, ...	49,725	
Three pairs of gates, and with water gates, .	5,311	
Stone work for hollow quoins, &c. &c. . .	3,784	
		72,882
Excavation from lock on W. to lock on E. extremity of line, 1,239,509 cubic yards, . .	433,828	
Excavation for six recesses, 57,797 cubic yards, .	20,229	
Wood work for sides of the canal upon development, 68,180 feet, recesses inclusive, . .	172,140	
Excavation for back drain, 22,911 cubic yards, .	9,163	
One tide lock, E. extremity of back drain, .	500	
Lock on Bear creek, already estimated, . .	73,034	
Draining during excavation of work, . .	17,900	
		726,794
Whole cost of this location, .		$872,176

This estimate, therefore, exhibits a difference, on the score of economy, in its favor, of $65,390, but its efficiency, under this estimate, would by no means compare with that of the line No. 4, upon the plan recommended. The difference existing in favor of the latter arises from its commodious basin at the point A, its wharf reaching entirely into deep water; and the shortness of the whole distance from the point of divergency of the several experimental lines, to the lock on Bear creek, as it conforms very

nearly, in general terms, to the minimum distance. A glance at the horizontal projection will show its advantages in this particular.

A line of level was run from Kennedy's point, denoted on the map by D. This level corresponds with the 1st location, estimated from B. M. IV eastward to the lock on Bear creek. It was referred to in that estimate as line No. 3. This supposed debouch is situated some distance north of line No. 4, on the Bon Secour; the ground is much the same in respect to its swampy character; it differs so little in horizontal projection, and the level being regarded as so nearly equal, that further remarks in reference to it are unnecessary. From point A, it will be requisite to excavate by dredging 47,248 cubic yards; from this point, also, to B. M. IV, the distance will be greater than by the first hypothesis. As there is no natural basin, nor depth of water of sufficient area for the accommodation of boats, it would be necessary to construct one; in other respects, the plan of this small section does not differ from that to B. M. on the line No. 4, already estimated for: the details will show the amount of difference in the cost.

Excavation by dredging from point A to jettee, - -	$11,812
For jettee 500 feet long, same dimensions for cross section as preceding, - - - - - -	7,570
Excavation for basin containing 160,000 square feet, -	8,148
Extra excavation for foundation of jettee, 2,222 cubic yards, - - - - - -	555
Embankment of clay in jettee, 4,444 cubic yards, - -	2,222
Tide and regulating lock, with coffer dam, - -	71,732
Excavation to B. M. IV, 363,080, - - -	130,708
2 recesses, - - - - - -	6,482
Coffer to protect extremity of work, - - -	2,081
Wood work for the sides of development, - - -	41,899
	$283,209

Thus we have for the cost of this section, 283,209 dollars, which, added to the cost as estimated for line No. 4, between B. M. IV and Bear creek, 566,578 dollars, gives 819,475 dollars as the total cost of this location. It has, therefore, in its favor, on the score of economy, a difference over line No. 4, of 118,091 dollars, and over line No. 5 a difference of 52,701 dollars. But it must be remarked that, in point of efficiency, it is below the former, in the same degree and upon the same grounds as line No. 5, the particulars of which I have already referred to in this report.

Island Creek route.—Line No. 2.

The supposed debouch by this location would take place about one mile and four-tenths on the river Bon Secour, above that of line No. 3, at E. The ground at this extremity of the project is low and swampy, differing in no respect from that of the debouch of No. 3, already adverted to. The distance on the Bon Secour from point A is 14,500 feet; upon this distance, excavation by dredging would be necessary, to an amount shown in the estimate subjoined. A lock would be necessary at the debouch of both extremities of this cut, upon the plan of those already estimated for. The excavation might be conducted between Bon Secour and Bear creek, in

better ground than has been met with in the lines previously discussed. Shortly after leaving the river, the level attains to 9 or 10 feet above the plane of comparison, and follows very nearly upon that plane during its whole development: the mean ordinate above the plane of comparison is 10.5 feet, and the distance across is 28,737 feet. The details for this location are as follows :

Estimate for line No. 2.

Excavation by dredging 88,348 cubic yards from point A to E, debouch of this line, - - - -	$22,087
Jettee 1,250 feet, to reach deep water for basin, - -	18,270
Lock and coffer dam, - - - - -	73,034
Trunk of the canal between the two regulating locks at each end of the line, - - - - - -	559,238
Development of wood work for sides of canal, inclusive of four recesses, 57,454 feet, - - - -	125,320
Excavation for four recesses, 45,192 cubic yards, - -	16,269
Lock and coffer dam on Bear creek, before estimated, -	73,034
Excavation for side ditches, as back drain, 25,544 cubic yards, - - - - - - - -	6,386
Draining during execution of the work, - - -	15,200
Amount of cost of canal by this route, - -	$908,838

By this it appears that this line has no advantage, even on the score of economy, over those already discussed, while its demerits are of the same character as those alleged against locations Nos. 5 and 3, but in greater degree.

Line No. I.—Shortest cut.

This route I caused to be levelled, as having been adverted to in the report of reconnoissance by the Board of Internal Improvements, as the shortest distance between the Bon Secour and the waters of the Perdido; it having been also indicated as the one most likely to be adopted, by the residents of that vicinity. The comparison of masses to be excavated on the several lines, shows the inexpediency of this project, without even a reference to the great distance between the common point of divergency of the several experimental lines and the point of debouch of this route. This distance on the river would have to be improved at great expense, and even then, from its winding character, it would be a great restraint upon the navigation, and would involve considerable delay. Although a project of a much less important character than the one I have adopted in reference to the size of boats, should be resolved on, and the hypothesis is supposed of boats of light draught being enabled to reach the point of this debouch by a natural navigation, it would yet, in point of expense, be found inexpedient; the other disadvantages, in point of distance, remaining the same, by comparison with the other locations. The mean ordinate of level upon this location, above the plane of comparison, is 25.4 feet, and above the bottom of the canal 32.9, the horizontal distance following the line of level 21.540 feet.

The details of expense for this line are as follows :

Estimate for line No. 1.

Excavation from point A to lock on portage, 118,725 cubic yards	29,681
Excavation for basin, 118,518 cubic yards	42,666
Lock and coffer dam	82,832
Excavation for trunk of canal, 2,178,616 cubic yards	706,087
Excavation for 4 recesses, 77,424	28,646
Wood work for sides of canal development, 43,570 feet	95,854
Lock on Bear creek, with coffer	82,835
Excavation for side ditch, 5,744 cubic yards	1,723
Draining during excavation of work	12,700
	$1,083,024

From lock on Bear creek to Perdido river.

The route of the canal will now be confined to Bear creek, and afterwards to Portage creek.

Bear creek, from the debouch of the proposed canal, down to its junction with Portage creek, is very irregular in its depth, varying between 9 and 4 feet, with an average of 6 feet; its mean breadth is 36 feet. To make this portion conform to the estimated width of the canal, would require an excavation of 22,512 cubic yards, through very difficult ground: its expense would be greater than in ordinary cases of excavation, and would be made up of the ratio between dredging and common excavation in loose sand and mud. From the mouth of Bear creek, a similar operation would be requisite in following down East Portage. The average depth from the mouth of Bear creek down to bay Lalande, varies at every step. The amount of dredging necessary to make it conform to the dimensions of the canal would be very considerable. It will be unnecessary to exhibit an estimate for a towing wharf, constructed on this section of the work, as it may be entirely dispensed with, although its accommodation, as regards other than steamboats, would be very great. As the expense of its construction would increase in a very considerable ratio the amount of the general estimate, I shall bound my views simply to rendering navigable the communication: particularly as, for a steamboat communication, such accessorial arrangements would be inexpedient.

From the mouth of Portage creek I caused a reconnoissance to be conducted to the Perdido, to verify the reports of residents in the vicinity, and persons who were in the habit of navigating the bay. A line of sounding was run, to determine that on the whole distance there existed a sufficiency of water for the project under consideration. The result of this examination showed that the minimum water of the channel was not less than a depth of 8 feet. The distance from Bear creek at the debouch of projected canal to the bay Lalande is $2\frac{5}{8}$ miles; thence, to its entrance into Perdido, $5\frac{3}{8}$ miles.

In the bay Lalande there is but little tide to molest its navigation, and being entirely land-locked, no inconvenience can arise from high winds: the same remark may be extended to Perdido river. The following estimate shows the cost of improvement to be effected between the lock on Bear creek, and the debouch into the deep water of bay Lalande:

Excavation, by means of dredging, 10,200 cubic yards, to mouth of Bear creek - - - - -	$2,555
Excavation in ground, 24,000 cubic yards - - -	9,600
Excavation, by means of dredging, from mouth of Bear creek to mouth of Portage, 46,220 cubic yards - -	9,244
Contingent improvements - - - - -	1,500
	$22,899

I now proceed to compare the three lines run experimentally between the Perdido river and the bay of Pensacola, which portion may be referred to as the second section.

I shall, first, discuss the properties of the Great Lagoon route. In this, a new element, differing from its mere fitness for canal purposes, is involved, namely, its liability to interruption from an enemy, possessing a predominating force on the Gulf of Mexico. The exposure a line of commerce might suffer from an enemy in time of war, is a consideration of the utmost importance, particularly as in the present case, where it relates to a project whose efficiency and value must be in a great measure estimated by its applicability to the purpose of sustaining our military establishments on the coast. In this respect, the present one, which has so many advantages over those about to be discussed on the score of economy, is greatly inferior. On the western extremity, in the present state of protection of this portion of country, great danger might be apprehended from the light vessels of an enemy, which could easily enter the Perdido, and ascend to the point where the canal should debouch, without subjecting itself to danger, the distance being only 3¼ miles. This could only be guarded against by military works at or near the mouth of the Perdido, or a naval force erected within the bar at its mouth, and sufficient to overawe the vessels of lighter draught that might otherwise venture within its waters.

It might also be apprehended that boats in the Great Lagoon would not be sufficiently protected by their distance from the projectiles of vessels lying without the tongue of land, or sand bank, which separates the Great Lagoon from the Gulf of Mexico. On approaching the bay of Pensacola, this danger ceases, owing to the protection afforded by the fortification on Santa Rosa island, with its collateral works. Another inconvenience however arises, the more important as it exists at every period, namely, the heavy swell which is prevalent there, owing to its contiguity to the Gulf. I am informed that this agitation of the sea is at times sufficiently great to prohibit egress from the Lagoon to such boats as might freely navigate any other portion of the project; and that, during certain seasons, deeply burdened boats of even the larger character might meet with delay, owing to this cause.

With regard to the simple question of expenditure necessary to construct the canal, it is, without comparison, cheaper than any route that can be found between the Perdido river and Pensacola bay. The work of construction would be confined to something less than a mile between the Perdido and the head of the Lagoon, and on a short distance at its mouth.

Two lines of level were run across the distance between the Perdido and the great Lagoon, one by the general depression of the ground from the Portage landing, the other by a chain of ponds, which exists a little to the north of it. The latter saves some excavation by means of the

ponds, which are sufficiently deep to be navigable during their whole length, about 1,300 feet: they are likewise of sufficient capacity to serve as basins for the accommodation of the trade. The horizontal projections of these two lines are found by reference to the map.

Experiments were made to determine the difference of height between the surface of the Perdido river and that of the Great Lagoon simultaneously. We found that, under the most favorable circumstances for such examination, there was a difference of height in favor of the Great Lagoon of .44 feet, or 5 inches and $\frac{3}{10}$ nearly: but this difference varies with the prevalence of different winds; and from the conformation of the entrances to the bays severally, it may be satisfactorily inferred that great inequality does frequently exist; for the winds that would tend to elevate the water at the debouch of the projected cut on the Perdido would serve to drain a great portion of the water from the Lagoon. If the waters from the bay and Lagoon were suffered to flow into the canal, by reason of their agitation in violent winds, and the sand they would carry in suspension during the time, to be deposited afterwards, the canal would soon be obstructed with alluvions, and rendered entirely useless. This circumstance would necessitate a guard and regulating lock upon each extremity of the line, however contiguous. The locks would, of course, be constructed upon the same general principles as those discussed in reference to the first section of the project; nor is there any modification of sufficient importance in the character of the ground, to involve a sufficient difference in the cost, to make it the subject of a separate estimate in a general report. The ground through which this line of excavation is conducted, is very inauspicious for the object proposed, and the same precautions would be necessitated, in regard to the sides of the canal, as were adopted in reference to the cut on the first section.

The details of expense, in reference to the experimental line No. 1 of this section, are as follows:

Estimate for line No. 1—1st section.

PERDIDO TO GREAT LAGOON, BY PONDS.

Jettee upon the Perdido, 50 feet wood work,	$752 00
Excavation for channel, with foundation of jettee, 555 cubic yards,	138 00
Embankment of jettee, 300 cubic yards,	225 00
Excavation on line, exclusive of locks, 90,760 cubic yards,	36,304 00
Lock, with coffer dam to secure foundation,	71,732 00
Wood work, sides of canal upon development, 6,546 feet,	14,401 00
Lock, with coffer dam on eastern extremity,	71,732 00
Coffer dams to secure extremities of line during execution of the work,	4,081 00
Excavation, by dredging to deep water on the Lagoon 500 feet, 4,870 cubic yards,	1,219 00
Wood work for jettee on Great Lagoon, 500 feet,	6,326 00
Embankment for jettee, 2,960 cubic yards,	2,250 00
Drainage during construction of work,	4,120 00
Back drain for canal,	1,087 00
Two tide gates for back drain,	1,000 00
Cost of this line,	$215,367 00

Estimate for line No. 2.

GREAT LAGOON TO PERDIDO.

Excavation for channel and foundation of jettee on Perdido, 555 cubic yards,	$138 00
Wood work for jettee upon Perdido, 50 feet,	752 00
Embankment in jettee, 300 cubic yards,	225 00
Excavation on line, exclusive of locks, 136,318 cubic yards,	49,074 00
Wood work for sides of canal on development, 8,600 feet,	18,920 00
Lock with coffer around foundation,	71,732 00
Do. do. on eastern extremity,	71,732 00
Dams to secure extremities of work during its execution,	4,080 00
Jettee on Lagoon, 500 feet, wood work,	6,326 00
Excavation, by dredging on Lagoon for channel and foundation of jettee, 4,878 cubic yards,	1,219 00
Embankment in jettee, 2,060 cubic yards,	2,250 00
Side ditch on development 8,600 feet, 3,822 cubic yards,	1,274 00
Two tide gates for back drain,	1,000 00
Draining during execution of work,	3,200 00
	$231,922 00

Thus, between the two experimental lines examined, there is a difference of expense in favor of the first line of $16,555. As this economy comports with other advantages, more particularly that of the accommodation to be derived from the ponds as natural basins, there can be no question as to the selection to be made in favor of the first line, in case the project by the Lagoon were adopted as the line of canal.

From the projected jettee, at the head of the Lagoon, there will be no obstruction to the navigation, as shown by the "examination" exhibited on the map, until we arrive at the mouth: here a sand bank of small extent is shown by the soundings, and which I have proposed to clear to the necessary breadth, and protect by a jettee. But I must remark, in reference thereto, that much difficulty may be apprehended in keeping it free from the deposites of sand, which vary in this vicinity in a degree that is perceptible from year to year. This is caused by the generally agitated state of the sea at the entrance of the bay, combined with the very loose and sandy character of the bottom, which is without admixture of any kind that may give it consistency.

In order to avoid these apprehended difficulties at the mouth of the Lagoon, arising from the very variable nature of the contours, I caused an experimental line of levels to be conducted across a narrow neck of land that separates the Lagoon from Pensacola bay, the distance being only 3,285 feet, and the ground being nearly level, excepting where a narrow crest of land of only a few yards intervenes. This location is much more to be relied on for stability and usefulness, and is, moreover, shorter. Although its apparent expense of construction may be greater in a considerable degree than the former, yet the absolute cost is of little weight in reference to the general project. I should therefore pronounce without hesitation in its favor. Here the canal terminates in reference to this project.

I subjoin the estimates for the two plans without further comment.

The details of expense, with a reference to the map, will furnish all the data to be required.

Line 1, at mouth of the Lagoon.

Excavation by dredging 11,744 cubic yards - -		$2,936
Jettee to secure channel, 425 piles driven, with incidental work - - - -	$2,040	
1,700 pile planks - - - -	5,100	
3,400 ties, 6 by 6 - - - -	1,224	
3,400 for girding frames, 4 by 6 - - -	850	
Wood work for pier head development, 60 feet -	318	
225 feet 3 inch plank platform, with securing and tie pieces - - - - -	180	
Cost of one jettee, with pier head - - - -		9,712
Do do without pier head - - -		9,214
Whole cost of jettee - - - - -		$21,862

Mouth of Lagoon—Line No. 2, by Scollop Pond.

Jettee on 600 feet - - - - - -	$8,400
Excavation by dredging, 6,000 cubic yards - - -	1,500
Filling in upon jettee, 1,185 cubic yards - - -	878
Excavation across the neck of land, 85,554 - - -	25,960
Wood work for sides of cut, 3,285 feet - - -	7,227
Jettee on the bay, 600 feet wood work - - -	9,000
Embankment in jettee, 4,800 cubic yards - - -	3,600
Excavation for channel, 9,000 cubic yards - - -	2,500
Back drain, 1,460 cubic yards - - - -	486
Tide gates for back drain - - - - -	1,000
Two dams at extremities of work - - - -	3,700
Draining - - - - - - -	4,500
Whole cost - - - - - - -	$69,751

The expense, therefore, of the whole work between the Perdido and the Pensacola bay, by this route, in adopting the location by the ponds between Perdido and the Lagoon, and that across the neck of land between the Lagoon and Pensacola bay, would amount to $285,118.

The next experimental line to be adverted to has its debouch on the east side of the Perdido, north of Inerarity's point, $6\frac{3}{4}$ miles from the mouth of bay Lalande, and near the mouth of bayou Wickley. The project consists of either a thorough cut, or a summit level canal, between bayou Wickley and bayou Grandé. I shall discuss successively their respective properties, but, in the first place, refer to the project with regard to its general merits, inclusive of the element that relates to its protection from an enemy. This line, I think, on that score, has equal advantages with the project hereafter to be referred to, namely, that between bayou Marcos and bayou Chico. Over the route by the Great Lagoon, upon this question, it has a decided superiority. It is for the military or naval

engineer to say what would be the amount of protection necessary to a debouch of a line of commerce from the bay Lalande, which appears to be the most exposed point of the two upper projects, and is equally a common point to them both.

Bayou Wickley is twelve miles from the mouth of the Perdido, and the bar at that point prevents the entrance of any but vessels of very light draught of water; whilst there is sufficient water within the bay for a large character of vessels, and room for their management. A work on Inerarity's point would command the debouch from bay Lalande, as well as the ascent of the Perdido; the distance across from this point being only 6,000 feet, very little more than one mile, whilst the channel is even nearer.

This work would be sustained by its contiguity to Pensacola from any approach by land dangerous to its safety. The debouch of this line is very favorable on its western extremity, by comparison with the character of ground usually encountered in this region: it is less swampy, and the water is deep in the river to within a short distance from the mouth of the bayou. The small sand bar that obstructs the entrance may be obviated by the plan projected, and referred to in this report for similar cases. The locks would also be upon the same plan in reference to the project of a thorough cut, which I am about to discuss. The line of canal would ascend on the same side of the bayou from its point of debouch, which would be above its mouth a distance of 14,000 feet. This requires improvement by dredging, as shown in the subjoined estimate. The line is conducted on the south side, although the ground is less favorable, in order to avoid crossing the creek above, which would involve considerable expense; the trunk of canal being, in such case, compelled to coincide with the body of the stream, intersecting it at right angles.

The character of ground upon the whole line is that of a loose sand, with scarcely any admixture to give it tenacity; the whole development of canal would require an abutment of timber to guaranty its sides from abrasion. Recesses, similar to those referred to for the 1st section, would be found expedient. The distance between the two locks, by this route, inclusive, is 25,870 feet. The mean ordinate above the plane of comparison is 13.117 feet, and 22.117 above the plane of the bottom of canal. I have supposed the plane of lowest water to be one foot and seven-tenths below the plane of comparison, assumed at ordinary high water. There is scarcely a perceptible change in the tide, varying only in ordinary cases about one foot. The ground is somewhat sloping towards the creek upon this line, excepting where the line crosses from the head of bayou Wickley to the head of bayou Grandé. In making my estimate for excavation, I have assumed the ordinate at two-tenths of a foot less than the line of level, attributing that advantage to be gained by the minuter process of location. The canal will, of course, possess the same dimensions in every respect as hypothecated for the first section. The canal, after crossing the low ground, which, by a fortuitous circumstance of topography, occurs at a certain point of the ridge dividing bayou Wickley from bayou Grandé, would descend in the valley of the latter to a point where the water in its bed has been found of sufficient depth to justify the improvement of its natural channel, and converting it to the purposes of navigation. Here a guard and regulating lock would be established, as in other cases referred to; its plane would be the same as for the one esti-

mated on the recommended project between Bon Secour and Perdido : its height would be less, however, by nearly one foot. The creek is of unequal depth for some distance below the point of debouch ; it would have to be improved by excavation to an amount shown in the estimate of expense. From where excavation ceases to be necessary at the head of bayou Grandé, there is found to be deep water, until we arrive at the mouth of the inlet from the bay of Pensacola ; here it would be necessary to resort to a jettee to protect the channel after it should be effected. I have found that it would be less expensive, and, at the same time, desirable on the score of facility to the navigation, to construct a straight channel from point A to B, denoted on the map. The bar at the mouth is here of the same character as that at Bon Secour river, and it would be equally vain, from the nature of the bottom and manner of its formation, to expect that a channel, without a construction to protect it, could sustain itself even for a short time. This being effected, the canal by this project is complete between the bays of Perdido and Pensacola.

The details of expense for this modification of the project are as follows :

Thorough-cut by bayous Wickley and Grandé.

Jettee at mouth of bayou Wickley, wood work - -	$7,500
Excavation for channel and foundation of jettee, 5,000 cubic yards - - - - - - -	1,250
Filling in upon jettee - - - - - -	3,000
Excavation of channel of bayou Wickley, 14,000 feet - -	3,350
Lock on west side - - - - - -	71,732
Dams to secure extremity of work - - - -	4,162
Excavation for trunk of canal, 1,483,438 - - -	504,368
Lock on east extremity of work - - - -	71,732
Wood work on sides of canal, 51,740 feet - - -	129,350
Four recesses, excavation 12,904 cubic yards - - -	4,387
Wood work extra development, four recesses, 490 feet - -	1,225
Basin, 250,000 square feet excavation - - - -	30,555
Wood work for basin - - - - - -	4,092
Back drain - - - - - - -	6,898
Excavation by dredging at the head of bayou Grandé, 61,298 cubic yards - - - - - - -	15,324
Excavation for channel and embankment, 98,759 - -	24,689
Wood work for pier at mouth of bayou Grandé, 5,300 feet -	56,262
Wood work for pier head - - - - -	488
Draining during excavation of work - - - -	21,000
	$961,376

The project between the Perdido and bay of Pensacola is now to be considered under another point of view, viz. the hypothesis of a summit level at eight feet elevation above the level of the projected thorough-cut. This arrangement would dispense with a very considerable prism of excavation, and proportionably decrease the chief expense of the work. The consideration that becomes implicated in this modification of the project, in respect to the volume of water necessary to feed the canal, will be referred to and discussed, upon the basis of the data we were enabled to collect, with the limited time and means at our disposal.

The waters of bayou Wickley and bayou Grandé were gauged at an

elevation of 8.5 feet above the plane of comparison, and 10.2 above the plane of lowest water; at this elevation were found in bayou Wickley 7.9 cubic feet per second, and in bayou Grandé 6.8, or 14.75 feet per second united; this amounts to a prism of 1,270,080 cubic feet per day. If this amount could be calculated upon throughout the year, it would be barely sufficient to feed the summit, which is, according to the plan I have assumed, 25,000 feet in length, and which would require for evaporation, filtration, and lockage estimated for 1,725 boats per annum, at least 1,028,544 cubic feet per day, allowing 105 cubic feet per mile per minute upon the canal for evaporation and filtration, the lockage being estimated at 1½ locks full for the passage of each boat, which is making due allowance for loss during the progress of its passage.

But the season in which the gauges were taken had been unusually wet, and therefore great deduction should be made, and I have thought it prudent to limit the estimate to one-third the volume of water found by the gauges as a fair average; this, however, is somewhat below the result, if we may give credit to the residents of the vicinity, who regarded the usual volume of water at about one-half of the amount it then yielded. Information of this character, however, should not be relied on without modification, as the ratio of decrease does not usually appear so great as it really is; the element of velocity in streams, which enters as a principal function in estimating their volume, being in a great measure overlooked by the general observer.

The amount of water, therefore, yielded by the only two streams in the immediate vicinity of this summit, would be 423,360 cubic feet per day, which, compared with the quantity requisite to feed the canal, would leave a deficiency of 605,184 cubic feet per day. Thus a summit level might be regarded as impossible, were no other waters available for this project.

Although the limited state of financial resources belonging to the survey did not permit minute and rigorous examinations to connect the data obtained in reference to the project between bayous Marcos and Chico, with those obtained in relation to the one just referred to, yet, reasoning upon general and comprehensive principles, deductions may be made with sufficient accuracy, from what is obtained, to show the practicability of a canal, with a summit level of eight feet elevation, between bayous Wickley and Grandé, by means of a feeder conducted from the waters of bayou Marcos. The fact that the waters of bayou Marcos are at a sufficient elevation to be commanded upon the projected summit level of Wickley and Grandé, is demonstrable. I caused the water in the former stream to be gauged with accuracy, at a height of 14 feet above the plane of mean high water in the Perdido bay; and Lieutenants Drayton and Ward, by a series of observations rigorously conducted, gave, as the amount of water afforded per second by that stream, 78.16 feet, say 78 cubic feet. Now, supposing that the surface of water in Perdido, at the mouth of bayou Marcos, to be in the same horizontal plane with the surface of water at the mouth of bayou Wickley, a supposition the least favorable possible to the proposition I wish to demonstrate, the point on bayou Marcos, affording the above amount of water, is still found to be six feet above the summit level of Wickley and Grandé. I say "the supposition is the least favorable that may be possible," because the mouth of bayou Marcos, being several miles above the mouth of bayou Wickley, on the river Perdido, the level of water on the first point, at any given time, under ordinary circumstances, must be higher than that at the second, and that thus we may

boldly assert that the point 14 feet higher than the Perdido level, on bayou Marcos, is at least six feet higher than the summit, assumed at eight feet above the level of Perdido at the mouth of Wickley. But, in order to leave no doubt as to the necessary elevation of water in the bayou Marcos, to feed the summit of Grandé and Wickley, by reference to the horizontal distance intervening, compared with the necessary slope to give to a feeder, I caused the levels of the bayou to be carried to an elevation of six feet above the point above referred to, and the water was in nowise diminished: this is substantiated by the fact that the bayou receives no accession from tributaries between these two planes of intersection. Thus we find that the above quantity of water, 78 feet per second, may be relied on at a height of 12 feet above the summit level of Wickley and Grandé, so far as a gauge at any one season may be regarded as a correct datum; but this is not a true proposition; and when time and means do not admit of a series of experiments at different seasons, great allowances should be made on the side of prudence, in estimating for a practical supply for the summit of a canal.

The information derived from persons acquainted with the ordinary state of bayou Marcos, would induce us to admit that a diminution of one-third of the above stated result would afford the general average of water in the stream; but, for reasons before stated in reference to bayous Grandé and Wickley, I will put it at two-thirds, and admit only 26 cubic feet per second as the average volume of water to be relied on from this source; that is, a prism of 2,246,400 cubic feet per day. To this may be added three cubic feet per second, found in the south fork of the same bayou, and three cubic feet per second in the two branches of bayou Chico at the same elevation, deduction being made in the ratio above stated, and we will have the whole amount of water to be derived from the summit level of bayou Marcos and bayou Chico, namely, 2,764,800 cubic feet per day.

The next element of the demonstration refers to the horizontal projection of the distance over which this water would have to be conducted, and the ratio existing between it, and the difference of elevation between the point from which the water is taken, and the summit level of the project to which it is to be applied, a certain slope being indispensable to the development of the feeder, to impart the requisite velocity to the water which it is destined to convey. The slope should not be less than four inches to one mile: this is admissible, as shown by experience.

The distance that a feeder would traverse, with very little deep cutting, would amount to 13.2 miles; this would require a fall of 4.5 feet only, whilst the difference of elevation between the point whence the water may be commanded, and the summit level, amounts to six feet: this comprehends the proposition in regard to the south fork of bayou Marcos and the two branches of bayou Chico. The waters of the north fork of bayou Marcos, as I have already explained, may be commanded at a higher point, if necessary. This point of the demonstration is, therefore, resolved.

It would, however, be advisable to give the feeder a fall of six feet upon the whole distance, as it would conform, throughout, a great portion of its development to the intersection of a plane nearly horizontal with the slopes of the intervening ridges, and be, in consequence, somewhat winding.

When we have shown the amount of evaporation and filtration due to this length of feeder, and deducted it from the whole amount, we have the actual quantity of water that may be commanded, on the summit level of bayou Wickley, from this source.

I will estimate the breadth of the feeder at 4 feet; the evaporation would therefore take place in reference to a superfices of 280,000 square feet; the filtration may be regarded as not unusually great, for although the soil is very sandy, it was a subject of remark to us whilst engaged upon the duties, that the water lay upon the ground after the rains for a length of time, and that where ponds existed, and they are abundant throughout this section of country, it appeared to possess the property of impermeability to a remarkable extent. At first, doubtless, a great deal of water would be absorbed, but, I believe, in the end, the channel would become quite impermeable. I have taken the average of water lost by the two causes of evaporation and filtration, in reference to canals in Europe, and have then taken the mean of that result, with the average loss of canals of this country, the latter being estimated, under similar circumstances of climate, at very much greater, which I should suppose must arise, in a great measure, from filtration or leakage, owing to some vice in the construction.

But, in order that no undue favor should be shown to the project, I will estimate the loss at somewhat above the mean just referred to.

Gauthey, deservedly celebrated as a civil engineer, gives the details of a series of experiments, conducted in reference to each month in the year, and gives, as the result, a loss, by evaporation and filtration combined, of a prism of 10,391 per annum, upon the area of the surface; in this he regards the filtration as equal to the evaporation, multiplied into 1.5. This, applied to the feeder in question, would give a loss of 217,536 cubic feet per annum per mile, about 596 cubic feet per mile per day. In allowing to enter as an element of the calculation, the loss on canals in the United States, the statement of loss is increased to an incredible amount; nevertheless, it is the safer side on which to err, and I wish to show the amount of water to be relied on, under the most unfavorable circumstances. I will, therefore, assume the loss to be on the feeder 8,640 cubic feet per mile per day, and 114,048 cubic feet per day upon the whole distance, which has been previously estimated at 13.2 miles.

Deducting this amount from 2,764,800, the volume derived from the two branches of bayou Marcos, with that from the two branches of bayou Chico, we have 2,650,752 as the volume of water to be derived from the waters of bayous Marcos and Chico. Let this be now added to the result in reference to bayous Grandé and Wickley, namely, 423,360 cubic feet, and we have the total of all the water that can be relied on for the summit level of Grandé and Wickley, amounting to 2,227,392 cubic feet per day. When this amount is compared with that requisite to feed the summit level, 1,028,544 cubic feet per day, for the passage of 1,725 boats per annum, we show at once the practicability of the canal on the score of water, in the hypothesis of a summit level at an elevation of 8 feet above the tide waters of the Perdido. I assumed 1,725 boats per annum as the amount of tonnage that might justify the project, but it is seen that more than double that number may pass through the canal during the same period, by reference to the quantity of water available for the summit. A dam is projected at the bridge on bayou Marcos, for the purpose of retaining a volume of water to supply deficiencies that might occur in the driest seasons, and other contingencies. Its capacity and expense are referred to in discussing the project between bayous Marcos and Chico. The details of construction will be modified from the plan for the thorough-cut. A jettee will be necessary on the Perdido, at the debouch of bayou Wickley, as already intimated: the locks will be of greater expense, by virtue of the additional

height of the walls, with the masonry incidental thereto, also with reference to the height of the gates, and the necessary precautions to secure the foundation. The lock will be situated where the dredging in the bayou ceases, at a distance from its mouth already adverted to; of course, the dimensions of the canal will remain the same as for the other parts of the system. The sides of the canal will be riveted with an abutment of timber, on a development of 45,960 feet. I do not apprehend that the ground in which the excavation is to be conducted, is of a character to require much expense in securing it against filtration. I have estimated for three recesses of the same dimensions as heretofore referred to on other parts of this work. There will be a lock on the eastern extremity of the summit, differing in no respect from that on the western. The other parts of the project are as have already been referred to, in discussing the project of the thorough cut by the same route. The distance from bench mark on the Perdido to the debouch on the bayou Grandé is 25,870 feet, but the length upon which excavation is conducted in ground is less, as already shown, by making use of the bayou for some distance above its mouth, as referred to above, and in the estimate.

The details for this project are as follows:

Summit of bayous Wickley and Grande.

Jettee at mouth of bayou Wickley, wood work - -	7,500
Excavation for channel, inclusive of jettee, 5,000 cubic yards	1,250
Embankment for jettee - - - - -	3,000
Excavation by dredging to improve the natural channel of the bayou on 1,400 feet - - - - -	3,350
Excavation to foot of lock on western extremity, 104,948 c. y.	31,454
Lock, with additional masonry for raidier and fall - -	114,000
Excavation on summit level, 835,446 - - -	250,633
Lock on eastern extremity - - - -	114,000
Wood work for sides of canal development of 5,280 feet, to the foot of lock - - - - - -	23,232
Wood work between locks on summit level, 40,680 - -	89,496
Coffer dams for protection of extremities of work - -	4,162
Three recesses, 24,195 cubic yards excavation - -	7,258
Wood work for recesses - - - - -	807
Draining during execution of the work - - -	15,000
Dam across bayou Wickley - - - -	12,800
Do. across bayou Grandé - - - - -	13,133
Back drain, 14,371 cubic yards - - - -	3,593
Feeder from bayou Marcos, excavation 40,000 cubic yards -	12,000
Deep cut summit between bayou Marcos and bayou Wickley for feeder, 35,554 cubic yards - - - -	10,666
Deep cut through ridge between bayou Chico, south fork, and Grande, 5,333 cubic yards, - - - -	1,599
Wood work for pier at mouth of bayou Grandé, 5,300 feet in length - - - - - - -	56,262
Wood work for pier head - - - - -	498
Excavation for jettee and embankment, 98,759 - -	24,689
Excavation by dredging at head of bayou Grandé, 61,298 c. y.	15,324
	$815,706

We see, by this estimate, that the difference of expense is in favor of the project by means of a summit level : the cost, as shown above, for a thorough-cut to connect the Perdido bay with the bay of Pensacola, amounts to 961,376 dollars, whilst in the estimate, in the hypothesis of a summit level, the cost would only amount to 815,706 dollars, leaving a difference of 145,670 dollars.

How far this difference would influence the adoption of either the one or the other project, becomes a consideration dependent upon the financial resources of the enterprise, when it shall be undertaken. As a drawback upon the advantages of the summit level project, it must be observed that a greater sacrifice of time will be necessitated in the passage of boats, because of the time requisite in filling the locks, which will be greater, in the ratio of the capacity of the locks, which are in the present case the greatest. This time, however, estimated in reference to the tonnage that passes, will not be greater than for locks of smaller dimensions.

When we contemplate the character of the work in point of magnitude, the greater efficiency of a thorough-cut in point of time, its greater security against casualties, which are generally greater in proportion to the complication of a project whatsoever, I am inclined to the opinion that the difference in cost should be disregarded, and that the thorough-cut should be adopted.

The last project to be considered is that between bayous Marcos and Chico.

The debouch of this line would take place about 2,700 feet above the mouth of the bayou, where a jettee would have to be constructed 1,500 feet in length, similar to that at bayou Wickley, and others referred to in this report. The distance on the bayou, between the jettee and the debouch, is bordered on either side by swampy, low ground, frequently inundated, but the channel is deep, and susceptible of being improved for the purposes of navigation. At the debouch, a lock of 8 feet lift, with the dimensions as in other cases, in regard to cross section and capacity, would have to be constructed : the height of walls would be as for the lock on bayou Wickley. The ground over which this line would be carried, is much higher than that between Wickley and Grandé, as will be perceived by the profiles, which give the lowest route that can be found between the bayous Marcos and Chico. The character of ground in other respects is similar to that between the bayous Wickley and Grandé, and the canal would conform to the plan I have discussed, in reference to that project. With regard to the quantity of water necessary to feed this elevation of 8 feet, there can be no doubt, as dependent upon the gauges of the bayou Marcos and the bayou Chico. The length of feeder being only 16,760 feet, will exhaust but little of the amount by evaporation and filtration, that is, 828 cubic feet per day, whilst the amount rendered by the sources above mentioned is 2,764,800 cubic feet per day, leaving as the whole supply for the summit level 2,763,972 cubic feet per day. The summit level would be 50,450 feet in length, and the loss upon this distance by filtration and evaporation, calculated upon the same principles as heretofore explained, would amount to 1,477,440 cubic feet per day : this, added to 312,000 cubic feet, the amount of lockage, estimating the tonnage at 1,725 boats per annum, would give the whole expense of water, namely, 1,789,440 cubic feet per day ; from which it appears there would be an excess of water to the amount of 975,360 cubic feet per day. Thus

there is more than sufficient for the passage of 2,000 boats per annum, which, considering their capacity, might be regarded as amply sufficient to justify the project.

I caused a level to be carried around the valley at bayou Marcos, in reference to a dam at the old bridge: by this, I ascertained that a volume of water could be reserved there to the amount of 5,355,000 cubic feet by a dam of only 6.5 feet in height; also, that a greater quantity might be secured by raising the dam, if it were found necessary, without greatly increasing the area of the surface exposed. It is this dam which I refer to in the discussion of the Wickley and Grandé summit. Dams might also be constructed on the south branch of bayou Marcos, and on the two branches of bayou Chico. It is unnecessary, however, to go into further detail on the subject of the supply of water for this summit, as its practicability, on this score, is sufficiently demonstrated.

The demerits of this project, in reference to the others, consist in the greater mass to be excavated, which is made evident by a glance at the profiles "exhibiting the relative masses to be excavated on each line," and appended to the map for the sake of convenient reference.

On the score of the quality of the ground through which the excavations would necessarily be conducted, it would have equal advantages with the route by Wickley and Grandé; but the distance from the common point of divergency at the mouth of bay Lalande, to a point of meeting opposite the mouth of bayou Chico, would be $2\frac{1}{4}$ miles in favor of the route by Wickley and Grandé, or $3\frac{3}{4}$, if we consider their points of debouch into the Pensacola bay.

This line would have a lock on its eastern extremity, at its point of intersection with the bayou, shown on the map by the bench mark a short distance above the navy hospital. Dredging will be necessary to some little extent, as shown in the estimate, after which the navigation will be unobstructed to the mouth of the bayou: here an excavation of considerable extent will be required, and also the construction of a jettee to protect the channel against alluvions, and to afford the conveniency of a wharf with pier head and light-house.

The general course this line would pursue is as follows: from the Perdido bay it would ascend the bayou Marcos to what is called the Portage landing; thence, by nearly a straight line, to a point on the south branch of bayou Marcos, near the "Crossing:" here a basin for the accommodation of the trade is projected; the line again diverges from the creek, cutting off a considerable bend, and passes in a southeasterly direction over a low, flat piece of ground, until it again strikes the head of the south fork; following this, it reaches the cypress swamp in which the south branch of bayou Marcos rises; it follows around the south side of this swamp to a narrow and low part of the ridge that separates it from the valley of the bayou Chico; crossing at this point into the said valley, by a cut of about one hundred yards, pursues the south side of the ridge to the head water of bayou Chico, and down the bayou to the bench mark before mentioned, near the navy hospital; from this point the route would be confined to the bayou, and debouch at its entrance into the bay of Pensacola.

Modifications of this route were surveyed, but I find that the least excavation and expense are involved in the one I have just traced: these are shown by the profiles and horizontal projections.

I have entered into an estimate, also, in reference to a summit level at a

superior elevation, involving another lift of eight feet. I have estimated the price of excavation to be saved by this plan, and find that it amounts to only $162,400, whilst the increase of expense involved by a double set of locks would amount to about $198,000, with the other incidental expenses. The greater expense of time in the passage of the locks, the greater expense of water in lockage, and the increase of casualties by the complication of the system, render it obviously inexpedient; whilst, on the other hand, a thorough-cut, which involves a much greater amount of deep and expensive excavation, would still require a pair of guard and regulating locks, so that the expense of the deeper cutting would be without compensation from another quarter in any considerable ratio : the difference estimated between the lift lock and the guard lock being not more than $35,000.

We thus find that "the middle way is best," and that, in respect to this route, a level of eight feet elevation should be preferred to either of the others. The details for this plan are as follows :

Summit of bayous Chico and Marcos.

Jettee 1,500 feet in length, wood work, for wharf, - -	$22,500
Filling in with clay 8,888 cubic yards, - - -	6,666
Excavation in channel and for piers, by dredging 34,718 cubic yards, with contingent improvement of channel, - -	10,415
Lock at B. M. on Portage, - - - - -	114,830
Basin 500 feet square, excavation 92,592 cubic yards, -	32,407
Waste wier for south branch of bayou Marcos, with precautionary constructions against freshets, - - -	1,000
Three recesses, 11,291 cubic yards excavation, - -	3,387
Excavation on line of canal, inclusive of summit level, 1,161,126 cubic yards, - - - - - -	515,592
Wood work for sides of canal between the two locks, 50,450 feet,	110,990
Wood work for 3 recesses, - - - - -	807
Do. for basin, - - - - - -	2,992
Lock at east end of work, - - - - -	114,830
Wood work for lock to debouch of the canal development, 3,500 feet, - - - - - -	7,700
Dams to protect extremity of work, - - - -	6,840
Excavation by dredging head of bayou Chico, 26,936 cubic yds.	6,734
Excavation of mouth of bayou Chico, 37,526 cubic yards, -	9,381
Do. for jettees, 12,542 cubic yards, - - -	3,127
Jettee 3,100 feet, with wharf, - - - -	46,500
Feeder line 16,760 feet, 7,448 cubic yards, - - -	1,862
Dam at bayou Marcos near bridge, embankment in natural soil, 1,333 cubic yards, - - - - -	333
Puddling for dam 3,200 cubic yards, - - -	3,200
Back drain, 50,450 feet - - - - -	5,600
Wood work for dam across bayou Marcos, - - -	9,600
Draining during the excavation of the work, - -	14,600
	$1,051,893

It appears, therefore, by this estimate, that the expense for the location of a canal, on the plan proposed, from the mouth of bayou Marcos to the mouth of bayou Chico, inclusive of obstructions at these points, would

amount to $1,051,893 : this shows a difference in favor of the summit of Wickley and Grandé, of $236,187, and in favor of the thorough-cut between Wickley and Grandé, of $90,517.

Thus have been enumerated and discussed in detail all the experimental routes that have been examined between the bays of Mobile and Pensacola, only omitting such incidental operations as would have swelled the report without exciting interest, and at the same time have embarrassed rather than enlightened the understanding of the subject. Such details may be examined, if it be thought desirable, upon the map and profiles in detail.

The estimates I have made of the relative expense necessary to the construction of the several experimental lines, with the remarks and explanations in regard to each, will carry with them our opinion as to the route that should be selected. The practicability of them all, however, admits of no question, and the question of expediency might turn the scale in favor of either.

In regard to the advantages to be derived from this work, whether considered in a national point of view, or as the enterprise of a corporate body, it is my province to say but little. It is a question entirely anterior to the operations of a survey; and the skilful and judicious engineer and enlightened statesman have previously exhausted the subject. I have only to say that, with the impressions full on my mind, derived from the reports of the Board of Internal Improvements, so comprehensive in their character, and those awakened by the liberal and extensive views of the honorable member from this Territory, I have examined the question, and, with the project immediately in view, have contemplated its national advantages with the wants of the region to which it refers. In every light that this great system of internal improvement has been presented to my mind, my acquiescence in its advantages is complete.

The subdivision of the work during the survey, in respect to the officers co-operating with me, was as follows :

Lieutenant T. F. Drayton was charged with the levels, and executed the profiles relating thereto. Lieutenant G. W. Ward surveyed the routes, with reference to topography and horizontal distances, under the immediate direction of Lieutenant Drayton. Lieutenant T. J. Lee had charge of the soundings, assisted by Lieutenant H. G. Lile, who triangulated the shores, with other incidental operations.

I cannot leave the subject without expressing to the bureau the high sense I entertain of the abilities of the officers with whom I had the honor to be associated on this survey; moreover, although the season was most inclement, owing to continual rains, in a country of marshes, the greatest alacrity was shown by them in the execution of their duties under every privation.

The maps accompanying the present report are as follows :

One large general map, with profiles generalized from Lieutenant Drayton's profiles in detail, by Lieutenant H. G. Lile, on a scale of four inches to the mile, marked A.

General map, reduced for convenient reference, marked B.

Three sheets of profiles in detail, marked No. 1, No. 2, No. 3.

The following table shows the expense of the several experimental lines, divested of their details. From the many combinations of which the several estimates are susceptible, I exhibit in figures the location that appears best, in reference to general efficiency, with that which comports with the minimum in point of expense.

TABLE showing the cost of the experimental lines.

		Cost of experimental lines compared.	Location by reference to efficiency.	Location by reference to economy.
From jettee at mouth of Bon Secour to lock on Bear creek, inclusive.	Cost of jettee at the mouth of Bon Secour	$75,990	$75,990	$75,990
	By line No. 4	937,566	937,566	
	By line No. 5	872,176		
	By line No. 3	819,475	- -	819,475
	By line No. 2	908,838		
	By line No. 1	1,083,024		
From mouth of bay Lalande to debouch on Pensacola bay.	From lock on Bear creek to mouth of bay Lalande	22,899	22,899	22,899
	By thorough-cut between bayous Wickley and Grandé	961,376	961,376	
	By summit level of bayous Wickley and Grandé	815,706		
	By bayous Marcos and Chico	1,051,893		
	By Great Lagoon, Scollop pond	285,118		
	By Great Lagoon line No. , at its mouth	137,229	- -	137,229
	Cost of bridges, culverts, light-houses, removals of dams, after completing of work, with contingencies	- -	199,783	105,559
	Whole cost of work	- -	$2,197,614	$1,161,152

I have now to refer to a reconnoissance between St. Andrew's bay and Choctawhatchie bay and river, executed in order to form some idea of the expense necessary to make an actual survey.

When our operations between Pensacola bay and the bay of Mobile were drawing to a close, I found that the resources of the survey were nearly expended, and I accordingly addressed the bureau to be informed of the course to be pursued in the existing contingency. In reply, I was directed to return to Washington to complete the drawings of the work already executed, when the appropriation should be expended; but the bureau intimated, at the same time, that it was desirable to obtain such information as I have above referred to in regard to St. Andrew's bay and Choctawhatchie river and bay. I accordingly expedited the business of the survey near Pensacola, and discharged the men we had employed as soon as possible, in order to husband the remaining funds, hoping that, by so doing, I might be enabled to execute one line of survey between the waters referred to. This I soon found to be impracticable on my arrival in the vicinity.

The country may be said to be entirely unexplored, for no information of a character to be relied on, was to be obtained; the locality in which we were to operate being entirely uninhabited, and very remote from any settlement. Men to aid our efforts could only be procured at a distance, by water, of sixty miles.

Although these embarrassments, and the low state of the finances of the survey, precluded the possibility of showing any results of a rigorous character, yet I was enabled to see enough of the ground to answer the terms of my instructions.

I have found that a stream falling into the bay of Choctawhatchie, at its northeast extremity, rises in the ridge separating the Choctawhatchie bay from the St. Andrew's; also, that the head waters and valleys of the St. Andrew's interlock with those of the stream referred to. It would be necessary to have an experimental line run between the waters of the two bays St. Andrew's and Choctawhatchie: this would have to be preceded by a minute reconnoissance, in order to find the approximative, shortest, and lowest route. The line connecting these bays, so as to debouch on deep water at each extremity, could not, I think, fall short of nine miles. The highest ground between them might be about from twenty-five to thirty feet above the surface of water in the Choctawhatchie. It is an entirely desolate region—the ground covered with high grass, and the heavy growth consisting of pine exclusively.

After the examination just referred to, we proceeded up the Choctawhatchie, in order to attain a point on Pine Barren creek, a tributary of the Choctawhatchie, whence it had been asserted that a short line to connect the Wappalony, an indentation of St. Andrew's, with the Pine Barren, might be relied on. The Pine Barren being a deep stream, could be rendered navigable by very little improvement. Our guide, however, appeared to have been in error; for the distance he led us across high ground could not have fallen short of eleven miles. I was enabled, however, from my approximate estimate of courses and distances, to infer that a much shorter line existed between these waters; and I think that, in the event of further explorations, the line should be taken in a southerly direction from some point on the south side of the Pine Barren creek,

three or four miles above its junction with the Choctawhatchie. The distance might be estimated between navigable waters at seven and a half miles; the ground would probably be about thirty feet above the surface of water in the Wappalony.

From these data, it appears that, preparatory to running a line of levels across any part of this dividing ground, it would be expedient that a minute reconnoissance should be made; and, as no one appears to be at all acquainted with the vicinity, it will require considerable time. The engineer employed in the present case would be compelled to make preparatory personal examination of the whole ground, which comprises an area of a very considerable extent, whilst, in ordinary cases, the most obvious routes are known and indicated by previous speculations. To make the necessary explorations and surveys, would probably exact from fifteen to eighteen hundred dollars.

The most efficient route for a canal would undoubtedly exist between the head of Choctawhatchie bay and St. Andrew's or Wappalony. By this means, the rapid current of the Choctawhatchie river would be avoided, and the distance shortened by reference to the general system of navigation. The ground over which it would pass is by no means unfavorable to the construction of the work.

The project enters as an element into the general system of internal coast navigation, so ably discussed in the reports I have already alluded to. Upon this system does it principally depend to sustain its expediency. Its local advantages, however, may not be entirely disregarded: it would afford a channel of commerce to the extensive valley of the Choctawhatchie, the fertile settlement of Holmes's valley, the Allaqua river and settlement, with a considerable region of country that possesses at present no commercial facilities whatsoever. In the supposition, it is true, we must regard the bay of St. Andrew's as already possessing a port of deposite for the accommodation of trade. But this would be a natural consequence; the more assuredly so, that the bay of St. Andrew's may be regarded as one of the finest havens upon our Southern coast. It does not devolve upon me, however, to enter further into this part of the subject: I therefore conclude my report.

The preceding details, estimates, and remarks, with the illustrative maps accompanying this report, are, with great deference and respect, submitted by

Sir, most respectfully,
Your obedient servant,
W. G. WILLIAMS, *Lieut. 7th Inf'y.*

Documents relating to the bill of the Senate No. 1, "*Supplementary to the act authorizing the Territory of Florida to open canals between Chipola river and St. Andrew's bay, and from Matanzas to Halifax river, in said Territory,*" *approved March* 2, 1832.

DECEMBER 11, 1832.

Referred to the Committee on Roads and Canals, and ordered to be printed.

The papers in the within schedule refer to the contemplated inland navigation from the Mississippi to Mobile and Pensacola bays, and from St. Andrew's bay to the Appalachicola river. They are intended to explain the proposed improvement of the Manshac, beginning at the Mississippi river, and terminating in the lakes east of New Orleans. 2. The object of the steamboat canal, directed to be surveyed by an act of Congress of the last session, which is now being executed between Mobile and Pensacola bays. 3. To furnish data upon which it is expected that Congress will make a liberal allowance to aid in the construction of a canal between St. Andrew's bay and Appalachicola, upon the great line of communication from the Mississippi to the Atlantic, surveyed under a special act of Congress, and ascertained to be practicable by experimental surveys subsequently made under the same authority.

These papers are offered to the Senate of the United States more especially to demonstrate the necessity of speedily opening a communication, inland, from the great channel of the Western States to Pensacola, which has been established, by the settled policy and legislation of the Union, as the great military and naval arsenal and depot on the Gulf of Mexico.

The system of fortifications projected for the defence of the bay and harbor of Pensacola, and the navy yard, is progressing with rapidity. Provision has been made by law to make Pensacola not only a naval depot, but a yard of repairs for the squadron employed in the West Indies. With a small additional expense to improve the existing natural channels, and to cut only six or eight miles through a level country, Pensacola may be made the great point for the deposite of a large portion of the productions of the Western and Southwestern States. The papers now offered in explanation of this improvement, are—

1. The correspondence between the British ministry and the Governor of West Florida, when that portion of the Territory was a colony of Great Britain.
2. A letter to the chairman of the Committee on Roads and Canals in the Senate, with their report.
3. Report of the Committee on Military Affairs in the Senate.
4. Commodores Rodgers and Ridgeley's letters.
5. Extracts from General Bernard's report on the Florida canal.
6. Report of Committee on Roads and Canals in the House of Representatives.
7. Extract from Captain Burch's report.

Respectfully submitted.

JOS. M. WHITE.

Extract from Roberts's account of the First Discovery and Natural History of Florida, published at London, 1763.

The road of Pensacola is one of the best in all the Gulf of Mexico, in which vessels can lie in safety against every kind of wind. The bottom, which is sandy, mixed in many places with ooze, is excellent for anchorage: the sea is never agitated here, because the land surrounds it on every side. It is capable of containing a great number of ships, as may be judged from its extent, and by the soundings which the figures in the plan exhibit in feet, a method more exact than if measured by fathoms.

The tides are irregular here as well as upon all the rest of this coast. All that hath been remarked is, that, in the space of twenty-four hours, the tide ebbs out of the harbor from eighteen to nineteen hours, and is from five to six hours flowing back again; and the greatest difference that hath been found between high and low water is about three feet; on certain days less; at other times without increase or diminution, although the currents are changing daily, but with no regularity—the winds, in all probability, being in some measure the cause of this variety. The depth of water over the bar, at the entrance of the road, in the middle of the channel, is never less than twenty-one feet.

Extracts from the unpublished correspondence between the British Ministry and the Governor of West Florida, in the years 1771, 1772, 1773, *and* 1774.

If Great Britain should at any time declare war against Spain, the communication with the Mississippi, by the Balize, would be impracticable while they kept possession of New Orleans. But I am informed that the communication with the Mississippi, by the lakes Maurepas and Pontchartrain, into the river Iberville, is very practicable for small vessels carrying about two hundred barrels of provisions, provided the Iberville was cleared of logs that now stop the passage; and it is said a canal may be cut to let the waters of the Mississippi into the Iberville, from a point above Fort Bute, on which the Mississippi strikes with great violence; and I am informed by a person that has lately arrived from thence, that the waters of the Mississippi, when it is low, are higher than those of the lakes; but these are facts I shall endeavor to know more accurately, as I propose going up to Fort Bute, if possible, before the winter, with Lieutenant Governor Durnford, in order to view the spot, and take the level of the waters. I shall not fail, upon my return, of transmitting to your lordship as satisfactory an account of our proceedings as lies in my power. Should this cut be found practicable, or a carrying place be established there, the troops may be supplied with provisions through this province, without going round by sea, and then up the Mississippi, for a few years to come; and, after that, I should suppose, at small expense, by the inhabitants settled around them, who will, in so fertile a soil, very soon raise much more than is sufficient for their own consumption.

To the Earl of Hillsborough.

PENSACOLA, *September* 20, 1771.

MY LORD: In my letter No. 24, I transmitted to your lordship the copy of a letter that I had received from Lieutenant Governor Durnford, con-

taining observations on the western parts of the province, from whence he had just returned, and I therein promised, when furnished by fuller information, to give your lordship some further accounts of that part of the country, together with Mr. Durnford's sentiments of the cut that has been proposed between the river Mississippi and the river Iberville. I now transmit five maps of the lands near Fort Bute, the river Mississippi, Iberville, Amite, and Comite, which now have been more perfectly examined than heretofore. Three maps also contain remarks on the rivers, soil, and situation of the country, and I believe are done with more accuracy than any others hitherto transmitted from hence. Your lordship will observe in one of these maps a plan of a town laid out on the Mississippi, near to the Iberville, which we propose to establish, and call it Harwick. This spot is universally thought to be very proper for the building of a town, as it will be a magazine (if the Mississippi settles) for supplying the upper country with British manufactures, and the Indian traders with goods, many of whom are now supplied from New Orleans. The produce of the country will be exported from hence, and all the furs and peltry that come down the Mississippi, great quantities of which now go to New Orleans. The communication may be either through the Mississippi, or the river Iberville, which last, and so through the lakes, may be made easy at no great expense for small vessels drawing five or six feet water, and for such would be preferable to the communication by the Balize. If the establishment of this town is approved of, it will be necessary to give the inhabitants some protection, and, in the plan, four redoubts and brick block-houses are proposed, which should be supported by troops. Mr. Durnford's observations on the river Iberville are, "that the logs which were formerly cut have sunk to the bottom, some few excepted, which appear in the Amite. The sunken logs help to cause obstructions in different parts, which require much trouble to remove: when these rafts are loosened, they float a small distance from others until they enter the river Amite, which is too wide to be blocked by logs. Some few trees have fallen across the Iberville since the attempt was made to clear this river: nothing appears to be wanting but to destroy, by fire, when the river Iberville is dry, the remaining logs which fill up the bed of the river, and prevent the purpose first intended, in cutting up this wood, from being answered; for, were the logs removed, the body of water issuing into the channel from the Mississippi might annually deepen it, and more especially if the proposed cut should be made, as the Mississippi water would then enter into this river with a far greater violence, and more than twice the quantity of water which now doth by the present channel, and is only eddy water; therefore cannot act with great force, being also stopped by very considerable rafts at the entrance of the Iberville. When the Mississippi is high, the current is very strong, and will be greater if the canal is made: the Iberville will probably deepen and widen, or both, otherwise the current will be too strong to row against it. The river Iberville, near Fort Bute, was either two or three inches off the bank; but lower down the bank increased, and near the fork was above six feet high."

Your lordship will observe that the ground is marked out between the river Mississippi and Iberville, in one of the maps, through which the proposed cut would pass. Mr. Durnford's sentiments on this cut are,

that it is practicable, but his estimate of the expense which will attend it *is* much greater than the immediate advantages that can arise to the province from the carrying it into execution. The remarks which he makes on the river Amite are as follows: " This river, as far as the Comite, is navigable for vessels drawing five feet water, but for some distance upwards it is extremely shallow: in many parts there is no more than two feet and a half water. The river was low at the time I visited it, but it raises five, six, or seven feet after rains. The Comite lately raised twelve feet in twenty-four hours, and fell as soon: the face of the country, as far as came under my notice, is small hills, intersected with little gulleys, which immediately receive water, and pour it into large streams, which causes their sudden rise after rains. The lands are every where rich and fertile north of the junction of the Iberville: southward, towards Lake Maurepas, the lands seem gradually to descend, and also appear less rich; the canes diminish in their size; the hard wood is inferior in quality and height to that up the river. Near the lake, the lands are more adapted for rice than any other produce; bear, deer, and wild fowl are plenty on the banks of this river, which abounds also with plenty of fine fish of various kinds. In general, these lands are valuable, being easily cleared, as great as cane land. This river and its branches, if well settled, would produce many valuable commodities; in particular, indigo, rice, hemp, and cotton. The soil, in some parts, is a brown, fat earth, and, high up, a whitish earth, mixed with marl, and a clay bottom. The branch of the Iberville, as far up as the forks, is supplied with its water from this: when that river is dry, about the end of September, this river is low, but raises again with every rain."

Mr. Durnford acquaints me that he has received information from Indians that there is a communication from the Amite, a small distance above the junction of the Comite, which runs in an east course near to the northwest branch of a large river, called Nintabinie, and which empties itself into the north side of Lake Maurepas, and runs into some of the Choctaw towns; and that there is reason to believe, with very little land carriage, a communication may be found to the bay of St. Louis, as, from the interior part of that bay, the Indians pass to the river Pearl, from which a branch communicates with a river which empties itself into the Lake Pontchartrain: and as many rivers empty themselves into this lake which run from the north, some of their interior branches very probably draw near each other, and the distance from the river Tanchipahoe to Lake Maurepas is very trifling. By the assistance of some of the Choctaw Indians, who usually hunt on these rivers, it may be easily known if such a communication can be had; and, in case of a rupture with Spain, we might, with more safety, communicate with the river Mississippi, by such an interior passage, than any other way; and, by being in strict friendship with the Choctaws, this passage would be very secure, as the Spaniards would scarcely venture to interrupt us from New Orleans, and they might be greatly annoyed by the Choctaw Indians, who are not far from the lakes, and whose friendship we must be careful to obtain. If this inland navigation is found practicable, it will be of great utility to a township, which is recommended to be laid out near to the junction of the Comite and Amite: the distance only is about fifteen miles to Baton Rouge, and the lands between the rivers Mississippi and Amite, superior

in goodness to those on the bank of the Mississippi, contiguous to this part. If the township of the Amite is approved of, it is thought a post should also be established there, to contain a church, to be defended by forty men, or occasionally a greater number, as they would be able to give assistance to the Mississippi, and keep the Choctaw and Mississippi Indians in order who hunt near these lands. The expense of this establishment, in putting up a redoubt, is estimated at £400, and two batteaux have been recommended to be kept here, capable of rowing ten oars, and to carry thirty men, the one to maintain the communication with Lake Maurepas, and the other for the river Amite.

Enclosed I also transmit to your lordship an estimate of expenses thought necessary to be incurred in establishing ourselves on the Mississippi, but I cannot agree in opinion that all these expenses are necessary at present. Our first attention should be to draw inhabitants together, and form settlements; canals and inland navigation may afterwards be effected, when they will prove useful to an inhabited country; and I think that, instead of incurring the expenses that will attend the cut, it will be more advisable for Government to grant an annual sum for the use of the province, to be expended in transporting, gratis, such settlers as are desirous of coming from Europe or the northern colonies to the Mississippi, who should be settled in townships and protected by troops; and, in a very few years, we should have such formidable settlements in the western parts of this province, and such numbers of inhabitants, as not to require the further protection of Government. These would also be so great a check on the Indians in those parts, that, by a little management, we should secure the interests of all the savages on the Mississippi.

I am confident that the great objection which has been raised to the settling of the Mississippi is, that a communication through the lakes cannot at all times be kept open between this place and that part of the country, except strong posts are erected upon the lakes, and at other places, to keep the communication open, or a more secure inland navigation can be discovered, as the inhabitants on that river, and their properties, would, in case of a war with Spain, fall as sacrifices to the Spaniards; but, should a rupture with Spain ensue, it is possible that the navigation and communication with the Mississippi, through the lakes, might, for a short time, be interrupted, unless they were established in proper places to keep the communication open; yet, if Choctaw, Chickasaw, and Mississippi Indians are kept in our interests, (an object that will always be attended to,) the inhabitants in these parts would still be secure at home, both in their persons and properties, for no force that the Spaniards could collect at New Orleans, were this country settled, would attempt to proceed up the river, or attack the inhabitants. On the contrary, all the settlements on the west side of the river Mississippi would be abandoned, and every Spanish settler in Louisiana must take refuge in the town of Orleans, or suffer their lives and properties to be destroyed by the savages. It is universally allowed that, if the Mississippi was settled, West Florida, from its situation, would soon become one of the most flourishing colonies in America, and would be of such consequence to Great Britain that it is generally imagined, should a war be commenced against Spain, an expedition would very soon be undertaken against New Orleans, as

the acquisition of that place would secure to us the whole of Louisiana, together with the immense interior country to the northward, and we should then soon be acquainted with the various inland passages on the west side of the river Mississippi which lead towards Mexico.

From the Earl of Hillsborough.

WHITEHALL, *December* 4, 1771.

SIR: I have received your despatches Nos. 20, 21, 22, 23, 24, and have laid them before the King, and I am happy to find my endeavors to second your zeal to promote the welfare of the colony, in those measures which appear to me to have been well calculated for that purpose, have been so well received. I think the settlement of those parts of the banks of the Mississippi which are within your Government, and the opening (if practicable at an easy expense) a communication of that river with Iberville, are important considerations; and, therefore, I cannot but lament that Mr. Durnford's reports and estimates were not prepared to be sent by the same conveyance with your despatches, as it is impossible, without those materials, to form any certain judgment of the utility of either one or the other propositions.

To the Earl of Hillsborough.

PENSACOLA, *March* 11, 1771.

MY LORD: In my letter No. 6, dated the 23d of December, 1770, and transmitted by the last packet, I mentioned to your lordship the reasons that had, till then, prevented my tour to the Mississippi, and that I proposed setting out for that part of the province in the month of February.

I have received a letter from Lieutenant General Gage, wherein he informs me that he had desired Brigadier General Haldimand to have the spot between the river Mississippi and the river Iberville visited by an intelligent person, and the heights and levels taken, and some estimate made of the amount of the expense that will attend making the cut proposed. I was in great hope that Captain Sowers, an engineer, sent here by the commander-in-chief to survey and report the state and situation of the stockaded fort and barracks here, would have found sufficient leisure to have attended me, and to have performed this service, but his time has been so much engaged in superintending the works mentioned in my letter (No. 10) that he could not be spared. This expectation, together with the hopes I daily entertain of the arrival of the Indian presents from England, a quantity of which was necessary to be taken with me, induced me to defer setting out before; and as the issue of the event, referred to in your lordship's letter of the 20th of September, between Great Britain and the Court of Spain, yet remains doubtful and unsettled, I do not think it prudent to leave this place until I shall receive further information upon this head.

Brigadier General Haldimand has now made application to send Mr.

Durnford, as engineer, to this establishment, upon that service, and I have directed him to set out with all convenient speed.

It will give me great satisfaction, upon his return, to be enabled to transmit such further information of the nature and situation of that country as may induce your lordship to submit to his Majesty your sentiments thereupon.

Extract from a letter of Governor Chester, dated Pensacola, 21st January, 1775.

The lands on the Amite are well wooded with profitable timber, easy to be cleared, and not so stiff as that on the Mississippi; the soil is rich and light, very fit for indigo, and many other valuable articles. Should Government ever incline to have a town in these parts, the forks of the Amite is the place I should recommend, having sufficient water for any vessel drawing six or six and a half feet water. But Manshac is the proper situation for the custom-house; the distance of the forks of Amite to Manshac is not exceeding twelve miles. Vessels could transport merchandise through the lakes Pontchartrain and Maurepas to the Amite, and bring back produce. The settlers at Natchez would procure such European goods as they want, 100 per cent. cheaper than they now get them at. Vessels sailing at the same time from England, one bound for Pensacola, and the other for Manshac, their course always being the same until they make this coast, that coming to Pensacola will, most probably, arrive, discharge her cargo, load again, and sail, before the other will arrive at her destined port, owing to the difficulty of navigation of the Mississippi.

Letter to the Committee from the Hon. Mr. White.

WASHINGTON, *January* 31, 1832.

SIR: The committee, of which your are chairman, were instructed, by a resolution of the Senate, to inquire into the expediency of providing by law for the survey of a steamboat canal from Mobile to Pensacola bay, and from thence to St. Andrew's bay. These are two links in the chain of internal navigation from the Mississippi, along the northern coast of the Gulf of Mexico, to a point which should be found most practicable for a canal across the peninsula of East Florida, projected in 1825, and so far approved as to authorize a survey to ascertain whether such a work could be executed. This survey was delayed, by various causes and pretexts, until 1828; and, in 1829, a report was presented, with a map of the coast, in which the only obstacle suggested was, the probable deficiency of water on the summit level, which could be determined by an experimental examination, to make which an appropriation was given by Congress. I learn, unofficially, from the head of the topographical engineers, that the latter project has been executed; and, although it may be some time before the report is ready, there can be no question of abundance of water upon the summit level. This last survey removes the only doubt as to the practicability of this great national object, of connecting, by inland navigation, the Mississippi and the Atlantic Ocean,

to avoid the tedious, protracted, and hazardous voyage around the point of East Florida. To the advantages of this great work, in producing a revolution in the commerce of the country, and bringing together the opposite extremes of the Union, I cannot add any thing more than will be found in the report of the *Committee on Roads and Canals in the Senate, to which I respectfully solicit your attention.* That part of the bill which provided for these subsidiary surveys, was stricken out in the Senate, because it was competent for the President to order them out of the annual appropriation for surveys. I have, however, never been able, under this or the late administration, to prevail upon them to detach a cent from that fund for any survey in the Territory of Florida.

Such seemed to be the tardiness with which these surveys were executed, that the citizens of the Territory, feeling all the embarrassments arising from the want of a safe and convenient harbor on the Gulf of Mexico, petitioned Congress for permission to cut a canal from the Appalachicola river to St. Andrew's bay, which is another link in the same projected internal communication. Congress, at the last session, gave that permission to the Territory, or any company organized under its authority.

Those most deeply interested have *procured a survey and estimate by Lieutenant Long, of the United States army, now on engineer service in Florida; which report is marked B.* I send you the act of incorporation. In a new country, just settled by farmers and planters, with limited means, and too remote to invite capitalists to invest large sums even in the most useful enterprises, I would most respectfully submit the propriety of aiding them by a grant of ten or twelve sections of land, to be selected by said company in bodies of a quarter of a section, and a similar grant to the company for opening the communication below St. Augustine. The United States is the great landholder, and they will derive a greater advantage from the execution of the work than any individual, and incur a corresponding obligation to aid in its completion.

The survey which I propose between Mobile and Pensacola bays is only of a distance over land of from four to eight miles, and will open a communication from the Mississippi to Pensacola, which has now become the great naval arsenal and depot for the Gulf of Mexico, and for our West India squadron. To supply the garrison and squadron at that place, inland, from the Western States, would, of itself, be an object of national consideration and benefit.

It would be an act of supererogation to attempt to point out the advantages of Pensacola as a place of rendezvous or deposite. They are developed in all the reports of the engineers, of the navy commissioners, and there are now bills on our calendar for a marine hospital, and making appropriations for the vigorous prosecution of the fortifications and navy yard. The next survey is of a short distance, eighty miles east of Pensacola, from the Choctawhatchie river into St. Andrew's, and thence, through the projected canal of which I have spoken, to the Appalachicola, making the navigation continuous from the Mississippi to the Appalachicola.

The canal which is proposed below St. Augustine is to connect the sounds and rivers on the Atlantic coast, and open a communication within the keys and islands to Cuba. This is fully developed in the letters re-

ferred to in report A. I propose a small appropriation, in land, to aid in the two works about to be commenced, and a survey of the others, described in paper D, by the time when a report will be made upon the subject of the canal across the peninsula of East Florida.

I have the honor to be, your most obedient servant,

JOS. M. WHITE.

Hon. WM. HENDRICKS,
Chairman of Committee on Roads and Canals, Senate.

A.

IN SENATE OF THE UNITED STATES, *January* 19, 1826.

Mr. HENDRICKS, from the select Committee on Roads and Canals, to which was referred "A bill for the survey of a route for a canal between the Atlantic and Gulf of Mexico," reported:

That they have given the subject all the examination which the means afforded enabled them to bestow. No documents accompanying the bill, they have availed themselves of the information of several gentlemen acquainted with the character of the country through which the proposed canal is intended to pass, and, from the best lights afforded, they have no hesitation in forming the opinion that the great importance of a canal communication between the waters of the Atlantic coast and the Gulf of Mexico, justifies the expenditure proposed, to determine the fact whether such communication be practicable or not; nor would the committee hesitate in recommending the measure, were the probability of a favorable result to the examination much more remote than it is. The committee are of opinion, from all the information which they have been able to procure, that this work is not only practicable, but much more easily accomplished than former estimates and opinions have supposed.

The committee would further remark, that, from an examination of the maps and charts of the coast from the mouth of the Mississippi river to the Appalachicola or the Suwanee bay, and from information to be relied on in relation to that coast, they are induced to report an amendment to the bill, by which the survey will be extended west, through the bays of St. Andrew's, St. Rosa, Pensacola, Perdido, Mobile, and Pascagoula, and through Lakes Borgne and Pontchartrain, to the Mississippi, by the Iberville or the canal Carondelet. It is believed that through the lakes, bays, and inlets of this coast, a perfect inland navigation may be effected to the Suwanee bay, a distance of three hundred and fifty miles, by cutting at a few points, in all not exceeding twelve miles. The appropriation proposed in the bill, it is believed, will be sufficient for this additional purpose.

Much valuable information on these subjects is contained in the letter from Mr. White, the delegate from the Territory of Florida, addressed to the committee, and to which they ask leave to refer as part of their report.

All which is respectfully submitted.

WASHINGTON, *January* 18, 1826.

SIR: In obedience to your request, I herewith send a copy of a letter I had the honor to address to the Secretary of War, requesting a survey

and estimate of a canal or ship channel across the promontory of Florida, with a copy of his answer, stating that the appropriation for such objects having been exhausted, the reconnoissance could not be made, unless the necessary funds were placed under the direction of his department.

It will be seen, by a perusal of that letter, that I had intended to communicate some interesting facts in regard to the practicability of forming an inland navigation from the Mississippi to the point at which the proposed ship channel should commence on the Gulf of Mexico. Since the introduction of the bill referred to your committee in the Senate, I take the liberty to suggest the propriety of an additional provision, directing a continuation of the survey from the Appalachicola river to the Mississippi; and, availing myself of your invitation, will now say what I intended, under other circumstances, to address to the Secretary of War.

It will be observed of the Mississippi, that after receiving to its bosom all the streams that flow from the mountains through the fertile regions of the West, its bed is unable to contain them. Large navigable rivers and bayous burst from its sides, and, flowing through the valley, some of them find an outlet in the Gulf. Of this description is the Manshac or Iberville, about ninety miles above New Orleans, running into the lake Maurepas, which communicates with the Gulf through Lakes Pontchartrain and Borgne. The Manshac runs into Amite river; and from their junction, sixteen miles from the Mississippi, the united streams present a fine body of water to the lakes, sufficient for all the purposes of navigation. The depth of the water in Pontchartrain is generally from eighteen to twenty feet. The bay of Manshac was opened some years since by Gen. Wilkinson, wide enough for the passage of boats, but, during the late war, the American commander, apprehending the approach of the British troops through that channel, ordered it to be obstructed by falling a quantity of cypress trees across it, which presents an obstacle to navigation until they are removed. It is believed that, by clearing out these obstructions, deepening and widening the bed, constructing small levees for a short distance, and cutting off a small point at the mouth of this estuary, a considerable portion of the waters of that immense river would find an outlet to the Gulf through the lakes, which would greatly improve their navigation, by an accumulation of water sufficient to overcome the feeble resistance of the tides, and form a current outward to the Gulf of Mexico. By this mode of conducting off the surplus waters of the Mississippi, two great evils would be avoided—the incumbent waters in the river, and the reflux from the swamps, both of which have been found to be detrimental to the planters on its borders.

It is believed by every person, practical or scientific, that the levees cannot be extended farther up the Mississippi, without manifest danger to New Orleans, and the contiguous country; and every one must be convinced that they are inferior to artificial sluices or canals, that would convey the superabundant water to the sea by other routes than the river. It will be seen in Cuvier's Essay on the Theory of the Earth, that the learned M. de Prouy had communicated important facts to explain the changes which took place on the shores of the Adriatic: having been appointed to examine into the causes of the devastations occasioned by the overflowings of the Po, he ascertained that this river, since it was confined by dykes, had, by deposites, so raised the level of its bottom, that its surface was higher than the roofs of the houses in Ferrara.

The Adige and the Po, like the Mississippi, are higher than the adjacent country; and the remedy against the disasters of annual overflowings is suggested by opening new channels to discharge the waters.

I beg leave to make an extract from a work of the most learned and philosophical writer that I have seen, of all who have written upon the subject of the Mississippi: "A deep canal ought to be cut, to carry a current from the river at all seasons, and above and below its efflux a strong levee formed from the river to whatever lake was made the deposite. We are far from expecting that this improvement will be carried into effect, though its beneficial consequences are too obvious to demand demonstration. Two causes oppose themselves to all human improvements—the difficulty of convincing the public of their utility and practicability, and the greater difficulty of withdrawing men from their habitual course." When the waters of the main stream flow out through the valley, and meet with no deposite or outlet such as the lakes, they rest on the back lands, and produce a reflux towards the river. By forming this communication, all these evils to the inhabitants are obviated, and the terrors of a crevasse in the levee, with its consequent destruction, avoided.

It is not incumbent upon me to discuss this subject here, further than to exhibit such a view of it as will demonstrate to the committee the necessity of at least a survey, that Congress may be enabled to act upon the certain information and official responsibility of its own engineers. There are several points below the Manshac, at which communications might be formed with Lake Pontchartrain, by cutting less than five miles. One at Bonnet Carre, where it is said that the river at low water is ten feet higher than the lake: the greatest elevation of the river at that point, during the spring floods, is estimated at twenty-three feet: this quantity, expanding over such a surface as the lake, would produce but a slight effect, whilst it would greatly diminish the body, and, consequently, the danger, of the river.

Should either of those two points be found too difficult or impracticable, a canal has been projected and surveyed, at or near New Orleans, from the river into the lake; either of which will accomplish the object of a commencement of an inland navigation from the Mississippi, around our southern coast, to the Atlantic. Through the lakes, and behind the islands which stretch along the coast of the Gulf, there is a safe interior passage to Mobile bay, a distance of 170 miles, free for vessels of any size that might be employed in that trade, without any impediments except the slight obstructions between the river and lakes. Between the bays of Mobile and Pensacola, a distance of fifty miles, there are but two interruptions to the water communication; a portage from Bon Secour bay to Perdido, of four and a half miles, and a half mile from the latter to the Grand Lagoon, which communicates with Pensacola bay, near the point lately selected by the United States for a navy yard and naval depot; making an inland navigation for that distance, by cutting five miles only, almost in a direct line, through a level country, and a soil mixed with clay and sand, furnishing every prospect of easy excavation.

But, sir, to show that nature herself intended this route to be continued, I beg leave to point the attention of the committee to the facilities it embraces. Santa Rosa sound makes out from the bay of Pensacola forty miles, to Choctawhatchie bay, of about the same length; from the end of

which, a few miles up East river, will reach a point within five miles of the west end of St. Andrew's bay, through a soil and surface presenting no difficulties to the continuation of the work; from that point to the east end of the bay, in a line with the whole route, is about twenty-four miles; from thence to the Chipola river, at a point near which there is a large, open, natural communication from the Appalachicola, is about two miles. Thus, with the inconsiderable obstructions at the Mississippi, the removal of small impediments at a few points, and the cutting of twelve miles, an inland navigation may be effected of 350 miles, from the Mississippi to the Appalachicola, the place at which the survey is to terminate by the bill referred to your committee.

It is seldom that nature is so bountiful to a people, as to those of the Southern and Western States; bountiful in the luxuriance of soil, and in the value and variety of products, and bountiful to excess in the facilities of commerce. The rivers that flow into the Mississippi connect together the Western States, whilst the Southern are connected by the sounds, lakes, and bayous, which form, and the rivers which flow into this great inland channel, extending around our southern coast. The body and branches of this mighty river and canal will hold them united by the indissoluble link of trade, interest, and intercourse, whilst the ship channel will connect them with the East, at every harbor, port, and point of contact, from the Alleghany to the Gulf, and from the Sabine to the Atlantic.

To effect an inland navigation of unbroken continuity for 350 miles, by cutting 12 miles, such is the labor to be performed, so cheap, natural, and so essential to an uninterrupted communication, from the North and East to the West, and from the West to the extreme South, and from thence to the Atlantic! Moreover, sir, the States of Tennessee and Alabama contemplate a canal from the Tennessee to the Alabama river, of which the bay of Mobile will be the outlet: thus rendering this canal important to those States, and more valuable to the Union. The people of the West have long had to contend against difficulties and dangers in transporting their produce to a foreign market. Though nature had given them a great outlet to the sea, it is far removed from the course of European trade: plunging into the Gulf of Mexico, they have many perils to brave, many leagues to traverse, before they reach the Atlantic. The dangers of the navigation subject them, on their outward passage, to shipwreck and plunder. Should they be fortunate enough to escape, on their return home, with the produce of their enterprise, they are retarded by the Gulf stream, Florida capes, and the still more appalling dangers of pirates.

Nature has given to the West the finest river in the world; and if the Government will remedy the defects of its distant disemboguement, they start with their Atlantic brethren in the equal race of wealth and prosperity on the great highway of European commerce, and the issue is left to their energy.

From the lowness of its banks, and the fragility of its levees, the Mississippi often bursts its embankments, and overwhelms the farms that cover its bottoms; and it would be idle to say to the committee, that such inundations over fields of cotton and sugar are ruinous in the extreme. To diminish this danger in the slightest degree, would be a national benefit far greater than would be commensurate with the cost to be incurred. I have, therefore, suggested, that, by clearing out the Manshac, the first

stage in the great route of natural canalling, you give the Mississippi an outlet through which much of its surplus volume would pass, into the lakes first, and then into the Gulf, without hazard to its borders, and with manifest relief to its levees.

It is thus that another eligible mouth is created, where it is so eminently useful; a portion of its waters, too great for its bed and current, drawn off, a surplus ruinous to its settlers, and hazardous to New Orleans. By this work, the marshes are drained, the hotbed of fever broken up, and death strangled in its cradle. By draining the delta of the Mississippi, millions of acres of land are reclaimed from inundation; a boundless field for industry and enterprise opened to the growers of sugar; and, in the course of time, our country freed from the tribute she now pays to the West India islands for the purchase of this necessary article of consumption.

This canal would connect all the bays and rivers of the Gulf; furnish a safe and easy conveyance, from all their ramifications, of the valuable timber and productions of their borders, to the ports from which they could be most conveniently shipped; give an increased value to the public lands through which it would pass, and thus remunerate the Government for its expenditures.

In the letter to the Secretary of War, as in this communication, I have advanced opinions with confidence, which, in some particulars, perhaps in many, may be erroneous; but that confidence has been inspired by a conviction of their general correctness, from observations during nearly four years' residence in the country, and the best information which I have been enabled to obtain from intelligent persons, whose attention has been directed to its examination. In my humble judgment, the expense of the work has been greatly overrated. When Mr. Gallatin estimated the expense of the canal from the Mississippi to the Atlantic at three millions of dollars, he had not the most remote conception that nature had done so much towards its accomplishment. What a different estimate would he have made, if he had known that, in 350 miles of that distance, only twelve miles of excavation was required!

When the subject of canals is introduced, the mind is involuntarily led to the estimate from a comparison with other works; and, as there is but one of great magnitude in the United States, that is selected. A moment's consideration will expose the fallacy of such a calculation. The grand canal of New York has been cut through a region where mountains were to be cut down and valleys to be filled up; miles of solid granite to be excavated, rivers to be crossed by stupendous aqueducts: a just comparison would demonstrate that several miles might be cut in Florida where one could be in New York.

The peninsula of Florida has been variously and erroneously represented, as it suited the visionary speculations of those who have written on the subject. I have lately seen it asserted by one writer that it was a solid mass of limestone; by another, that it was a sand bank; both equally remote from the truth. Limestone, in masses, may be found in situations more elevated and remote from the sea; but in this peninsula it occurs in irregular strata, with the interstices occupied by earths and exuvia. This general character is demonstrated not only in the numerous sinks and cavities which indent the superstrata, but by the infinite number and variety of subterranean watercourses that penetrate and pervade the

bowels of the earth. And it is important to remark that, although the presence of the limestone is a prominent feature, yet it is only a portion of the general mass; for, within a short distance of the margin of the great Alachua prairie, and near the centre of the peninsula, a well of 32 feet deep penetrated 29 of the distance through an uninterrupted bed of clay, to a compost of clay, sand, and shells, where water was obtained; and at another well, distant three miles, but near the same prairie, limestone occurred, but it opposed no other obstacles to excavation than what were easily surmounted by the axe and the spade. From these data, therefore, and others afforded by the spacious and deep beds of the lakes with which this region abounds, it is evident that the work of excavation for a canal is, in a great measure, performed by nature, and that the remainder may be completed without encountering any of the difficulties inseparable from regions characterized by primary formation.

The route of this canal will pass through a country abounding with lakes and natural channels, and, where excavation may be necessary, it will be in clay and argillaceous soil, and occasional limestone, and the banks could be secured, if occasion required, by the cedar and cypress, of which the vicinity furnishes an ample supply. As the object is to obtain more accurate information by the employment of scientific engineers, any further remarks on this subject would be superfluous.

The attention of the American people has been strongly directed to internal improvements. The brilliant example of Great Britain in the old world, and of the States of New York and Ohio in the new, furnishes a happy augury of its extended utility to the citizens of this Union. The waters of the Eastern main are already connected with the lakes of the North, which, in their turn, by the enterprise of Ohio, will soon pour out their waters into the Ohio river, burdened with the produce of a mighty nation. To descant on the utility of a measure like this, would be useless. By it, the products of the soil are wafted to a distant depot. The tiller of the soil, no matter in what latitude he may live, no matter how distant his destinies may have thrown him from the ocean, finds, by the bounties of Providence and the enterprise of Government, the merchant at his door ready to exchange for his labors the price of its value, and thus new facilities are added to the channels of commerce, which have been scattered by the bountiful God of nature with so prodigal a hand over our continent.

Fifty years ago, canals were unknown in England; and within that period, fifteen millions have been expended in their construction. Their foreign commerce has been enlarged, and their internal trade has far exceeded it in extent, value, and importance. One hundred and sixty-five acts of Parliament have been passed for making and perfecting them. What results may not be anticipated from this internal navigation in the United States? By the completion of this work, the commerce of the whole continent will be changed; boats will pass with safety from St. Louis and Pittsburg to the interior of Mississippi, Alabama, and Georgia; these States will return their products through the same channels to the centre of the Union, or meet shipping for foreign ports, around the Florida coast at the most convenient ports. The period is not distant when a boat, starting at New York, will pass up the grand canal, through the lakes, Ohio canal, and thence down the Mississippi, along this channel, and dis-

charge her cargo at Mobile, Pensacola, and St. Mark's, St. Augustine, Savannah, or Charleston, by a safe navigation. The heavy item of transportation in time of war is diminished tenfold. Cuba ceases to be of any importance to us in a political point of view; the Moro Castle has no terrors in time of war; the pirates are broken up; an expensive naval armament is no longer necessary; the public lands are enhanced in value; the commerce of the Indies and of the Southern continent will pass through our borders, and the various commercial, military, and political advantages of this great nation, "rising into destinies beyond the reach of mortal eye," will be developed, and called into practical operation.

I beg leave to call the particular attention of the committee to the maps sent herewith.

I have the honor to be,
With high considerations of respect,
Your most obedient servant,
JOS. M. WHITE.

Hon. WM. HENDRICKS,
Chairman Com. on Roads and Canals in the Senate.

Copy of a letter from J. M. White, Esq., Delegate from the Territory of Florida, to the Secretary of War.

WASHINGTON, *November* 20, 1825.

SIR: As Delegate from the Territory of Florida, I deem it my duty to address you on some of the subjects of internal improvement in that portion of our empire immediately under the control of your department.

It is known to you that the Territory of Florida has a defenceless sea-coast of 1,200 miles, bounded by the Gulf of Mexico on the west, and on the east by the Atlantic. From Suwanee river to Tampa bay, and from thence to St. Augustine, a distance of seven or eight hundred miles, there is no safe anchorage, and scarcely a settlement on the coast. It is proposed, by a canal, or thorough-cut, from Vacassar bay, at the mouth of the Suwanee river, to the St. John's river, to connect the waters of the Gulf and the Atlantic. The distance across the peninsula is said to be about ninety miles, and the distance of cutting, to unite the waters of both, is said to be, by one route, eighteen miles, and by another only twelve miles. The Suwanee river discharges itself into Vacassar bay, which is represented to be spacious, affording a good harbor and anchorage. It is very probable that, should engineers report in favor of a ship channel, which will be more particularly referred to hereafter, it may require double the distance of canalling, say twenty-four or thirty-six miles, to avoid the sinuosities of the streams; or some other points more advantageous for its commencement and termination may present themselves to intelligent and skilful engineers who may be ordered to the spot; but I am assured the distance of canalling will not exceed the last mentioned distance.

The facilities of this enterprise are at once visible, from an examination of the map; its advantages, to a comprehensive mind, will readily occur from the same inspection. The largest portion of East Florida is

a peninsula, four or five hundred miles from the Georgia line, on the north, to Cape Sable, on the south, and only ninety from east to west. The produce of the Western States rolling down the Mississippi, and that of the States of Mississippi, Alabama, and Georgia, and the Territory of Florida, by their numerous rivers, pass into the Gulf and along the coast of Florida, around the peninsula, twelve hundred miles. By a canal, or thorough-cut, the distance would be shortened about one thousand. The navigation around the capes of Florida is the most dangerous on the American coast. The Tortugas banks, Florida reefs, and shoals of the Bahamas, combined with the depredations of pirates, occasion to our citizens an annual loss estimated at five hundred thousand dollars. It would be needless to say that this canal or cut would furnish a safe navigation, as well as a short one, and the annual loss we now sustain would be doubly, perhaps fourfold, sufficient to complete it.

I would beg leave strongly to call your attention to this subject at the present moment. Congress, at the last session, appropriated thirty thousand dollars to make estimates and surveys for internal improvement on an extensive plan; and, whilst we are yet a Territory, that the withering doctrine of State rights may not blight the hopes of a rising country, we ask your aid. After the survey is completed, such an appropriation as was made by Congress to connect the waters of the Muskingum with the Cuyahoga, a stream of Lake Erie, or the one subsequently made to connect the Wabash and the St. Mary's, and the Plein and Chicago flowing into Lake Michigan, will be entirely adequate.

The great duty of a Government is to defend the territory committed to its charge, and its first policy to invite emigration to its borders. The United States have, in Florida, about twenty millions of acres of lands. These have been partly surveyed, and one inconsiderable sale effected, and much of it is yet unknown and unexplored. By this canal, emigration would be invited to the interior, and extend its progress to the rich streams with which it would communicate. Farm houses and villages would spring up in what is now a wilderness, and the tide of population roll on to the shores of the ocean. Lands which are now a lake or morass, would bloom with rice or cotton.

It is not in this alone that a canal would benefit the Territory. It would give to her means and facilities of defence, which the nature of her coast has denied: it would make her ports the depots of foreign wealth, and the emporium of Western products.

To the Government an immense profit would accrue from the increased value of public lands; many thousand acres may be reclaimed from inundation, and a considerable saving by what then would no longer be necessary, the expensive equipment of vessels for the suppression of piracy. This canal has much higher claims to the attention of the Government than the single interest of the Territory can give it. The Western States of our Union are vitally interested in the measure. The Mississippi rolls its majestic course through four thousand miles of our richest territory; the numerous branches which contribute to its grandeur, are, themselves, mighty rivers running from the north and from the south, from the east and west, fertilizing the regions through which they flow, and connecting, by the links of commerce, the whole Western world.

If, in a tract of internal navigation, so widely extended and diffused,

spreading its wealth, facilities, and its blessings, over mountains, plains, and deserts, the pioneer of commerce should meet with some obstructions, left there by nature for the enterprise of man, it is his duty to remove them. It is for this that Government is instituted, that the congregated wealth, energies, and intellect of a people should be united, and directed to the diffusion of general good, when individual means would fail. It is for this, too, that our Government has, or ought to have, the power, in its confederated union, that the national means might be applied alternately, with undivided strength, to the perfection of each of its parts, in all the power of national wealth, energy, and intercourse. We are not a nation of soldiers; and, but for an object such as this, our Union, in time of peace, would hang on the wearied limbs of the confederacy, like a rusty coat of armor, unseemly to the eye, and burdensome to the shoulders.

It is estimated that the produce boated down the Mississippi alone amounts to nearly one-third of all the exports of the United States. This, passing into the Gulf, draws its wearied way round the capes of Florida to the Atlantic coast. By the proposed canal, more than a thousand miles of sailing would be saved, the manifold dangers I have enumerated shunned, and the frequent wrecks, resulting in the ruin of thousands, totally avoided. I would ask if these are not deep and important advantages. If these are not appalling responsibilities for that Government to incur, who will leave longer undone a work so cheap in the execution, so deeply freighted with blessings to one-half of its population? I would ask if this would not stab deeper into the vitals of piracy than any armament the Government can equip. No naval force can approach their haunts, embosomed in creeks, forests, and morasses. No piratical force can approach our commerce, embosomed in a canal through the heart of our country. The islands that afford them shelter are approached no longer, and the vile trade is destroyed by robbing them of their victims. Such ports as Key West will no longer be a graveyard for our brave seamen, and the occupation of their shores will cease with the cessation of their cause and necessity; our navy may then breathe a purer atmosphere, and boast a nobler service.

These, sir, are some few of its advantages in time of peace; but should our happy country be again visited by the calamities of war, we should have from Massachusetts to Mississippi, from Mississippi to St. Augustine, from one end to the other of our wide-spread empire, one connected chain of internal communication. The most distant sections of our country may then interchange their products without the hazard of foreign aggression. The trade of the North and New York will pass up the great canal to Lake Erie, and from thence, through the Ohio canal, to New Orleans; and from thence, through an internal navigation, which I shall have the honor to submit in some future communication, to Mobile, Pensacola, and the coast of Florida, and up the numerous rivers of Alabama and Georgia; and these States, by the same route, will send back their sugar, rice, fruits, cotton, and timber. The Government would find a facility and safety in the transportation of soldiers and munitions of war, hitherto so much desired; and by the introduction of steam, which already spreads its benign influence over the world, extending to the noblest objects of art, and not disdaining the meanest, the transportation of the mail would be expedited, and commerce, communication, trade, and

a common interest, unite together, by a chain of gold, the East and the West; shiver the fabric of sectional prejudice, and bring, by the annihilation of space and distance, the settlers on opposite frontiers into immediate neighborhood with each other.

But, sir, in the now enlightened, though tardy policy of our Government, it has been deemed sufficient, for the construction of a public work, that it was attended with local advantages alone. The grand canal of New York, which pours into her treasury, like the fabled lap of Danæ, showers of gold, is local, partial in its benefits. The hundred canals of England, which intersect that country, are local and partial also; and so with the contemplated junction of Ohio and Erie, of Chesapeake and the Delaware; and these form a sufficient impulse to their construction.

In the canal for which we ask, I trust, sir, I have shown the deep local interest of my constituents. I trust I have done more; that I have shown the deep interest of the Government itself, and of all the States west of the Alleghany. I think I have shown it to be the most efficacious mode of suppressing piracy in those seas in which they are nested, by deserting the seas themselves, and forcing them to seek a more honest subsistence by diverting the commerce on which they fatten to a safer channel. At St. Augustine, or the mouth of the St. John's, where our commerce would flow into the Atlantic, you well know, sir, there are no islands or forests, or imbecile Governments, to whom they could fly for protection. It is all a boundless and friendly ocean, too remote from their harbors to dread their presence.

We have yet further claims on the Government for assistance. The youthful republic of Mexico has already signalized its independence by a projected ship channel, connecting the waters of the Pacific and Atlantic, through the isthmus of Nicaragua. This done, the commerce of the Southern continent would disembogue itself in the Gulf of Mexico, and pass directly along the coast of Florida. Thus, not only the Western States, who trade directly through the Gulf and around the peninsula, to the Atlantic, are interested in the Florida canal, but make it a ship channel or thorough-cut, and the whole eastern section of our seacoast and country, by a shorter navigation, a safer and better, through Florida to the Gulf, and through Nicaragua to the Pacific, will find an outlet for their commerce. The mouths, into the Gulf of Mexico, of the two channels, as proposed by the projectors, are nearly opposite to each other; and commerce would be saved, around the coast of Mexico, of Guatemala, and Cape Horn, four thousand miles of perilous navigation, and more than one thousand around the capes of Florida.

I hope, sir, these will not be considered the day dreams of a visionary projector. The practicability of the scheme would be manifest to your engineers on an inspection of the country. The expenses of the work cannot be compared with any other canal, because no similar experiment has been made; an estimate from the expenditures in the excavation of canals through the granitic and calcareous regions, it will readily occur to you, would be entirely fallacious. The soil through which this would pass, is of the description denominated by the geologist red sand and river alluvion, passing below where the mountains terminate near the Gulf, with few undulations, and requiring, in all probability, no

locks or aqueducts. The greatest argument in favor of a thorough-cut or ship channel, without locks, across the peninsula, will be found in the situation of the Gulf, and the consequences resulting from the fact that the waters of the Gulf are higher than the Atlantic by several feet, owing to two causes—the tropical trade wind blowing from the coast of Africa in that direction, and impelling the waves in the same course for twelve hundred leagues, until, encountered by the east wind, the water is heaped up in the circle, or what is called by the natives cul de sac, formed by the shores of Mexico, Louisiana, and Florida. This is accounted for, as you have no doubt observed, by philosophical writers, on the same principles of analogy as the flood tide in the Mediterranean, and the accumulation of waters in the harbor of Marseilles, and the Red Sea at Suez. To this may be added an auxiliary cause, the discharge of all the waters of the tributary streams into the Gulf. This, however, is of minor importance in producing the constant current, known to mariners by the Gulf stream, when its extent and magnitude are considered, and when we advert to the fact that, of all the streams that flow into the Mediterranean, a greater quantity is taken off by evaporation, which is demonstrated by the influx of water at the straits of Gibraltar. Whatever may be the speculations in regard to the cause of the elevation of the waters of the Gulf, one fact is clear, that it must seek its equilibrium in some direction. This it cannot do between Yucatan and Cuba, because the double current of air and water sets in from that quarter; the only channel left is on the north side of Cuba, along the Florida coast, and channel of the Bahamas. Being unobstructed in that course by the trade winds, and protected by the island of Cuba and the Bahamas, it pursues its direction with considerable velocity, around the Atlantic coast, to the banks of Newfoundland. It is apparent, therefore, that a communication once effected through the peninsula, the waters which have the greatest accumulation on that part of the coast of the Gulf would seek an outlet by a gentle current, similar to the one on the Bahamas banks. These facts, however, can be made known to you, when the levels are ascertained by skilful engineers with mathematical certainty. Should it be found, upon examination, that the current from the Gulf to the St. John's was too strong for a vessel to stem, the distance is so short that steamboats would rapidly ply along the channel, as they now do in the Mississippi, and tow the laboring vessel to its destined harbor. It will not escape you, that vessels coming around the cape, from the eastward, would avoid the influence of this stream for one thousand miles, where it is most dangerous. By this scheme Cuba ceases to be what she now is, the key to the Gulf of Mexico. The trade of America would then pass by neither of her coasts; and into whatever hands she may fall, whether the Patriots who now threaten her shores, or remain under the dominion of pirates, who have long governed her counsels, is of no moment to us, who have, by this, found an outlet of our own, distant alike from each section of her treacherous channel.

I have now endeavored to present the facilities, advantages, and practicability of a channel through Florida. If I have trespassed too long on your time and attention, I beg you to look to the importance of the subject, to the deep interest involved, of the Territory, the Government, the Union, and the world. The necessity of extending to settlers the in-

ducement to emigration; of protecting our coasts, now so much exposed; of extending to the trade of your Western country the protection of your parental care; of breaking up the nest of hornets who infest our trade, by making it our interest to desert those seas in which alone they can harbor themselves; of counteracting the influence of the Gulf stream in the intercourse from east to west; of facilitating the intercourse by mail of our distant regions; of giving to Government, in time of peace or war, the facilities of universal internal transportation; and, finally, rendering the commerce of all nations that trade in that quarter tributary to our shores, by making it their interest to pass from east to west, from west to east, from one great ocean that circles the globe, to the other, directly through our soil: such, sir, are some few of the advantages of a Florida channel, that I have attempted imperfectly to press upon your attention. The undivided interests of a mighty empire like this are always pressing and urgent; and now that our climate is most congenial to the health of strangers, I would beg leave to suggest the propriety of an immediate survey, that the report may be made before the end of the session, and the great work, teeming with blessings to thousands, may be immediately consummated. I could here add, sir, that our Government has abandoned the imposition of taxes for the purpose of revenue; and whilst we rely for that object on imposts and custom-house duties, there are no means so certain to increase them as the opening of new ports and constructing new channels of commerce. And whilst I believe that such incalculable benefits will result from the work proposed, the millions who will be enriched will never fail to remember, in their benedictions, the munificent Government which achieved it.

I have the honor to be,
With high considerations of respect,
Your obedient servant,
JOSEPH M. WHITE.

Hon. JAMES BARBOUR, *Secretary of War.*

Copy of a letter from the Secretary of War to J. M. White, Esq.

WAR DEPARTMENT, *November* 29, 1825.

SIR: I have the honor to acknowledge the receipt of your memoir, dated the 28th instant, disclosing the great benefit which would result from a canal to be cut through the Territory of Florida, by which a short and safe passage might be substituted for the present circuitous and dangerous one around the Florida cape, and recommending it to the attention of the Executive so far as to obtain a reconnoissance of the country by the United States engineers.

It is due to the occasion to acknowledge that the view you have presented imparts a high interest to the subject, and is entitled to the most respectful consideration. But, at this time, it is impossible to cause the inspection you request, as the means and persons under the control of this department are both wanting. Should it be the pleasure of Congress to place under the control of the Executive the necessary means for making

further surveys of our country, the measure you suggest will claim its earliest attention, with every prospect, from its magnitude, of a favorable decision.

I am, very respectfully, sir,
Your obedient servant,
JAMES BARBOUR.

Hon. Jos. M. White,
Delegate from Florida, now at Washington.

Lieutenant Long's letter.

Tallahassee, *February* 8, 1832.

Dear Sir: Agreeably to your request, I here furnish you with such observations as I have made with regard to the advantages of St. Andrew's bay for general commercial purposes.

St. Andrew's bay is a complete inland body of water, in its whole extent of great depth, and in every respect may be considered a most excellent harbor for any vessels employed in the merchant service. It is protected from the sea by a ridge of sand hills, which separates the harbor from it for about six miles in extent. This ridge is nearly covered with green shrubbery, presenting a very agreeable and pleasant view from the bay. It also furnishes a complete barrier to the turbulence of the open sea, and secures a perfectly calm and easy anchorage within. The most southerly part of this narrow ridge extends past the main land for upwards of two miles, forming a channel or sound, for the only entrance to the bay, of about half a mile in width in a northerly direction. This sound extends along the coast southerly for fifteen or twenty miles, into which there are numerous passes from sea. Two of these, it has already been ascertained, have water enough to admit the heaviest class of merchant vessels; one has eighteen feet and the other twenty-one feet of water, which can be carried into the bay. The most remarkable features of the bay are its extensive arms, which compose nearly the whole of it; one projecting westwardly nearly to the Choctawhatchie bay, another northerly, about twelve miles, and a third in an easterly direction, about twenty miles, to the mouth of the Wetappo creek, into which the proposed canal from the Appalachicola river would enter. These arms have but few expansions into any considerable breadth, and are so sheltered by the surrounding country, that the surface of the water is generally calm and smooth, presenting the agreeable aspect of a perfectly quiet roadstead. The tongue of land between the northern and eastern arms of the bay furnishes a most excellent position for a town site. It is a sandy, pine wood country, which it would appear would be no otherwise than healthy. The water is of very good quality, and the ground quite free from marshes or stagnant pools. It is perfectly open and free to the sea breeze, which comes fresh from the water, and gives a cool and pleasant air during the whole of the warm seasons.

The easy approach to the bay from sea is another great advantage over most of the harbors of the Gulf coast. The passes into the sound above described have different courses, so that vessels can always enter, what-

ever direction the wind may blow, and the course to them is through the clear and open sea. Both for a harbor and a place of trade, should the St. Andrew's bay canal be effected, it appears evident that no place on this coast can be found, combining the very obvious advantages here represented of the place in question.

With great respect,

Your friend and servant,

GEO. W. LONG.

T. BALTZELL, Esq.
Member of the Legislative Council.

INTERNAL IMPROVEMENT.

Internal improvement is making rapid strides in the older States. The list of railroads and canals, either completed or in progress, far exceeds our expectations. While contemplating these great works, and the splendid results that must follow their completion, we, in this young Territory, can do little else than hope that, at some future period, public spirit, and more adequate means, may transfer to our shores some of the improvements of the age. Certainly on no coast can internal navigation be extended so far, at comparatively so trifling an expense, as along the Gulf of Mexico. For instance, good steamboat navigation, entirely inland, may be had from New Orleans to Bainbridge or Columbus, in Georgia, a distance of about four hundred miles, by excavating at four points, not exceeding in all *sixteen miles*. And the points requiring excavation are favorably removed from the action of waves in storms, have an even surface, and are but little elevated above tide water. Here, then, is a favorable opportunity for art and industry to aid nature for the permanent benefit of our country.

Much has been said, by eminent statesmen, of a railroad from the eastern extremity of our Union to New Orleans, on which, as an item of national benefit, the United States mail might be transmitted with a rapidity beyond former conception. Although the time is short since the bold idea was first advanced, yet sections of this great highway and railroad, connecting important points of steam navigation, are already completed, and now in progress. Cannot the advantages of our coast and inland navigation be made a part of this great thoroughfare? Is it not, in short, apparently designed by nature as the most direct, feasible, and cheapest route possible? Whoever will cast his eyes over the maps of Mississippi and Alabama, will find so many large rivers and streams intersecting the country, liable to be swollen by rains beyond their ordinary beds, and must be struck at once with the great difficulties to be overcome, and the vast expense requisite to construct a railroad through these States. The next best as well as rapid conveyance is by steamboat, on inland waters not subject to the storms that occasionally sweep the ocean, and not liable to be interrupted by ice in the winter season. Here our coast offers the requisite advantages of inland waters, with but *four* interruptions, safe from storms, and free from ice, from New Orleans to Georgia, to wit, through the lakes, Mobile, Perdido, and Pensacola bays, St. Rosa sound and bay,

St. Andrew's bay, Hort's lake, and the cut-off into the Appalachicola river about one hundred miles above its mouth. From some point on the Flint river, near Bainbridge, it is believed the country would admit of a railroad in a direct course, at the least expense, to Milledgeville or Augusta, and which would cross fewer streams and obstructions than any other route through the State. These remarks are designed as hints only to those whose talents and influence enable them to foresee the progress of improvements, and so direct detached parts as to lead to a finished whole. It is not, however, very extravagant to anticipate the completion of the improvements spoken of, since the boldest imagination could not reach what has actually been accomplished within the last ten years.

If this were now completed, and steamboats passing daily, conveying the mail and the numerous passengers that would prefer this direct route, distributing along our coast not only the provisions and riches of the West, but, also, all manufactured articles which a growing population, in a new country, requires, we could form some idea of the bustle and enterprise, the activity and growth, which our seaports should exhibit. Then would a trip to our Atlantic cities be but the pastime of a few days, and where now a solitary passenger is seen jolting his weary way in our mail stages, hundreds then would crowd the more comfortable cabins of the steamboats, or the rapid and easy cars of the railway. Then would our mails come with certainty, neither steeped in the discolored waters of swollen creeks, nor worn and disfigured with jolting and old age. The saving to the Government would be immense in the transportation of the mail, in the travelling expenses of naval, military, and disbursing officers. These items, with the increase of the consumption of dutiable articles for the first twenty years, would pay for the whole improvement.—*Pensacola Paper.*

TWENTIETH CONGRESS, FIRST SESSION.

IN SENATE OF THE UNITED STATES, *January* 23, 1828.

The Committee on Military Affairs, to which was referred "A bill authorizing the establishment of an arsenal at or near Pensacola, in Florida," made the following report:

The subject of the bill submitted to the consideration of the committee, was introduced in the annual report of the Secretary of War, which accompanied the President's message at the commencement of the session, and of which the following is an extract:

"I beg leave, on this occasion, to submit for consideration the expediency of establishing an arsenal somewhere contiguous to the northern coast of the Gulf of Mexico. The existing arsenals in the southern portion of the Union were established prior to the acquisition of Florida, and their location was adapted to the then existing boundaries of the United States. The annexation of Florida has greatly changed those boundaries, and given a new and very different character to our southern frontier. The most southern arsenals are, one for the seacoast on the Atlantic, at Augusta, in Georgia, and one for the southwestern frontier,

at Baton Rouge, in Louisiana. These were the most advanced positions that could be safely taken at the time they were selected. But they are, neither of them, conveniently situated for supplying the frontiers of our newly acquired territory. The line of seacoast between the rivers upon which these arsenals are situated, (the Savannah and the Mississippi,) is very extensive; and that part of it lying between the State of Louisiana and the southern extremity of Florida cannot be conveniently supplied from any of the arsenals now established. This part of our frontier is much exposed; a considerable portion of the army is now posted on it; and it is presumed that it will always require the presence of troops. It is for the supply of this extensive and exposed frontier that an additional arsenal is considered necessary. The location of the great southern naval depot in that quarter forms an additional reason for the establishment in that vicinity of a military depot also.

"Whether the southern part of the States of Mississippi or Alabama, or the western part of the Territory of Florida, will afford the most eligible position for the site of an arsenal for the general purpose stated, this department is not prepared at this time to offer any decided opinion."

It appears, from this report, that there is no arsenal nearer to this important point than at Augusta, in Georgia, distant about 500 miles, and Baton Rouge, on the Mississippi, about 250, leaving the whole southern frontier between those two points, including a seacoast of 1,300 miles, without an arsenal for the safe keeping of arms and munitions of war. In the report of the board of United States engineers, in which the defences of the seacoast are projected, one great division has been denominated the "Gulf of Mexico frontier." After a detail of the nature of the coast, the increasing population, and vulnerable points, the following description is given of Pensacola bay:

Pensacola Bay.—The upper arms of this considerable bay receive the Yellow-water or Pea river, Middle river, and Escambia river; the tributaries of which latter, interlocking with branches of the Alabama and the Chattahoochie, indicate the courses whereby, at some future day, canals may convey a part of the products of these rivers to Pensacola.

Santa Rosa sound extends eastward, from the lower part of this bay, into Santa Rosa bay, whence a communication, partly natural, partly artificial, may possibly be continued eastward to the Atlantic. On the west, the Lagoons of Pensacola, Perdido, and Mobile bays, respectively interlock in such a manner as to require but a few miles of cutting to complete a navigable channel from the first to the last named bay, and thence, through an existing interior water communication, to the city of New Orleans.

The contiguity of the head waters of the large rivers emptying into this part of the Gulf, to the upper part of the Tennessee, induces the belief that some facile means of connecting them will, ere long, be discovered and applied.

Thus, situated as Pensacola bay is, with respect to the country on either hand, and the immense regions behind, its rare properties as a harbor become of inappreciable value. Some of these properties we will enumerate. 1st. It is accessible at low water to the largest class of sloops of war and small frigates; and, as the bar is narrow, may perhaps be made to admit still larger vessels. 2d. Its bar is near the coast, and the channel

over it is straight and easily hit. 3d. It is perfectly land-locked, and has a very capacious roadstead. 4th. It has excellent positions for repairing, building, and launching vessels, and for docks and dockyards, in healthy situations. 5th. It has abundance of good water for the supply of vessels; and 6th. It is perfectly defensible.

As these and other properties, in conjunction with its situation as respects the coast and the interior, have induced the Government to fix upon it as a naval station, and a place of rendezvous and repairs, we shall, for the future, consider it in that character, both in its relations to the commerce of the Gulf, and its own proper defences.

Although a naval station, nearer the extremity of East Florida, might possibly enable our vessels of war the better to watch over our commerce in the Florida stream, still no deep harbor exists to the south of Pensacola, in which the circumstance of an entire separation from all relief and supplies does not greatly outweigh this advantage, if indeed it be more than imaginary.

It is, however, far from certain that the Florida stream is always to be the channel of communication from the Gulf to the Atlantic. The great embarrassments and losses to which we must be exposed, while that continues to be the course of our Gulf trade, so long at least as we have not the mastery on the ocean, and in fact so long as the island of Cuba is in the possession of another power—to say nothing of the natural dangers of that navigation—have directed the public attention seriously to the project of opening a shorter and safer passage through the head of the Florida peninsula. No obstacle, not insuperable, it is presumed, will prevent the execution of this grand design; and, considered in reference to such an outlet, Pensacola is most happily situated.

But the object of a naval force in this quarter is not alone to watch the transit of commerce to and from the Gulf; it has the coasting trade of the Gulf to protect—it has piracies to suppress, which confine themselves to no particular strait; and, above all, it has to keep an uninterrupted and watchful guard over the place of deposite, as well as the issues of the disposable productions of a region without parallel as to extent and fertility.

Projecting, as the delta of the Mississippi does, into the Gulf, the position of the Pensacola enables it to direct naval operations upon the rear of any force investing or moving along the avenues to the city of New Orleans; and at the same time that it can, almost to the last, with the help of a fortified line of interior navigation, preserve its communication with that city unbroken, it will be at no moment entirely dependent upon that line for the supply of its means of defence or annoyance, unless, indeed, the proposed artificial connexions with the interior, before pointed out, should be found impracticable.

A very exact survey has been made of the bay of Pensacola, which would suffice for forming a scheme of defence, if no other object were in view than the security of the town and harbor. Considered, however, as a naval station, and a place of rendezvous and repairs, further surveys, extending a greater distance from the shores, delineating accurately the face of the country, and showing the several avenues by land and water, are found to be necessary.

The western extremity of Santa Rosa island is, nevertheless, so situated in respect to the mouth of the bay, as to require, in part, the same works

in either case; and the board can, therefore, whenever ordered, project a fort for this position, which, in either case, should be the first occupied.

It is evident, from the above report, made by the board of engineers, after a thorough examination, that improvements are contemplated in that quarter, which will furnish the means of transporting our arms and munitions of war to any point by an interior water communication, where they may be needed for the defence of that frontier. The committee are of opinion that the arsenal should be located near to the coast, and at the most important point to which the militia may be called for the defence of the country, and from which the arms and munitions may be easily transported by land or water. The committee do not doubt, from the projection of the defences, and the establishment of our navy yard and naval depot at that point, that it will be rendered impregnable against an enemy from without; and, from the situation of the country, there is every prospect that a point can be selected where the arsenal will be safe in that vicinity. They are also of opinion that the rendezvous at that point of our public vessels in time of war, intended for the protection of the coasts of Louisiana, Alabama, Mississippi, and Florida, gives to it additional claims for a military depot; as those vessels might be rendered auxiliary to the rapid conveyance of munitions to any point of defence on these coasts that emergency might require; and to the Western States such an establishment seems highly interesting, as nearly all their commerce finds an outlet through the Gulf of Mexico.

The committee refer to the following extract from a memorial of the Legislative Council of Florida, as a part of this report, and think the luminous arguments employed by them in favor of a naval depot have equal application to it as a military station, and as a depot for arms and munitions of war.

"In conclusion, your memorialists would beg leave to represent to your Excellency the superior advantages of the harbor of Pensacola over any other on the Gulf of Mexico south of New Orleans, and suggest the policy of selecting it as a naval depot by the Government of the United States. Although engineers have been appointed to make a survey of the harbor, who are amply competent to form a correct estimate of its importance, yet it is to be hoped that the suggestions of your memorialists may not be considered obtrusive, but received with complacency, as the offspring of a lively interest in the welfare of this Territory, and of the United States. From a survey that has been made of the harbor of Pensacola, under the orders of the General Government, it is understood by your memorialists, that at the lowest water, vessels drawing not more than twenty-one and a half feet water may cross the bar and enter the harbor with perfect safety. The medium depth of water between the highest and lowest tide may be confidently estimated at two additional feet, making, in the aggregate, twenty-three and a half feet. It is believed that, from the best advice which has been obtained upon the subject, this depth of water on the bar is sufficient for the entrance of vessels of any description, save those of the largest class; the locality of the bay is likewise such as to secure every facility to the entrance and departure of vessels. The opposite extremes of its oblong form extend in a northeasterly and southwesterly direction, which happily corresponds with the general range of winds, so as to subject vessels to very little delay in their arrival or departure. After vessels have entered the bay, they have every assurance of the most perfect security,

even in the most violent gales; it is completely land-locked by the main land and the island of St. Rosa; it is uncommonly capacious, and its bottom, affording a stiff tenacious clay, constitutes a safe and excellent anchorage. From St. Carlos de Barancas to the opposite point on St. Rosa's island, is computed to be about three-fourths of a mile; with suitable fortifications at those two opposite positions, it is confidently believed, by military gentlemen of science, who have visited them, and expressed an opinion that no vessel could pass into the bay without receiving a fatal injury; the guns of both fortifications could be brought to bear upon it with so much certainty and effect as to ensure its destruction. Every examination which has been made of these commanding stations, has resulted in the decided opinion that it can be much more easily defended than any other on the Gulf, if not on the whole of the Atlantic coast.

"A faithful topography of Pensacola and the adjacent country will demonstrate that it may be very efficiently protected from the inroads of the enemy by land. In the rear of the town, at the distance of about half a mile, the highlands are presented, upon which military works may be constructed to advantage, so as completely to command the whole space intervening between them and the bay; a single fortification, strongly and judiciously built, would successfully bear upon the entrance into the town in every direction. There is, probably, no other station on the southern coast, which could be defended by land with so small a number of troops, or at less expense.

"Independently of the facility with which Pensacola may be defended, if reliance is exclusively reposed on regular troops, there are other prominent considerations which powerfully recommend it to the attention of the General Government. This results from its immediate connexion with New Orleans, and its contiguity with most of the States on the Mississippi river. In cases of emergency and invasion, should it become necessary to call the aid of the militia for the protection of this place, they can be readily obtained from Louisiana, Mississippi, Kentucky, Tennessee, and Alabama; owing to an advantage from a water communication, they may be conveyed to Pensacola in a short time, and comparatively with small expense to the General Government. Your memorialists are induced to believe that half of the expenditures of the late war were included in the item of transportation. Much would be saved on this score, were Pensacola selected as a naval station, not only in the transportation of soldiery, but also in provisions and the munitions of war. This desirable object would be more completely accomplished, should ever a communication be opened between the bay of Pensacola and the Mississippi and Mobile rivers. Another prominent advantage in favor of Pensacola, which gives it elevated claims on the patronage of the Government, is, that it is distinguished for the salubrity of its atmosphere and mildness of climate; it is a situation where her troops may always calculate on enjoying good health, and where it is represented that breadstuffs and other provisions continue almost as long in a perfect state of preservation as in most of the Northern ports of the United States.

"In addition to this, your memorialists will take the present occasion to remark that a military force stationed at Pensacola would, in time of war, give efficient aid in the defence of New Orleans, as well as additional security to Louisiana, Mississippi, and Alabama, by presenting a formidable barrier by which inroads through West Florida would be checked and

prevented. This assistance could not, with any certainty, be obtained from Tampa bay; and no other position, it is believed, can be selected south of Pensacola, which promises the other important advantages we have described. In consequence of its remaining at a great distance from a dense population, and the difficulties of transportation, it cannot be so conveniently connected with the adjoining States, and must rely for defence almost entirely upon regular troops, a much larger number of which will be necessarily required.

"The occupation of Pensacola, with the necessary fortifications, is calculated to afford a more complete command over the commerce of the Gulf of Mexico than any other position which could be selected on the southern coast; with this peculiar advantage, the United States would exclude the shipping of an enemy, probably, from the only port in Florida in which they could anchor with safety, owing to the violence of the West India gales. Your memorialists are of the opinion that there is no other harbor, save that of Havana, in which they could ride with security during a storm. But the benefits arising from the selection of Pensacola as a naval station, are not entirely of a negative character; we should not only be enabled to exclude the hostile armaments of foreign nations, but our own vessels could be protected from capture and disaster. The harbor of Pensacola will always be a place of secure retreat, a station from which expeditions may be fitted out without interruption, and from which the West India commerce of an enemy might receive the most successful annoyance. Were New Orleans assailed, Pensacola would be competent to afford co-operation for its defence, both by land and water, which could not fail to excite in the enemy the most fearful apprehensions. By our vigorous and well-directed efforts, her commerce would be cut off, her detachments captured, and, in the end, her surrender and retreat accomplished. The security of this place, then, is believed by your memorialists to be inseparably connected with the prosperity and defence of New Orleans and the contiguous States."

EDMUND LAW,
President of the Legislative Council.

Teste,
ROBERT MITCHELL,
Clerk of the Legislative Council.

The committee are not disposed to confine the selection of the War Department to any particular point, notwithstanding the many considerations which recommend Pensacola; and, therefore, propose that the words in the 5th and 6th lines, "*at or near Pensacola, in Florida,*" be stricken out, and that the words following be inserted, "*somewhere contiguous to the northern coast of the Gulf of Mexico,*" in lieu thereof. This will afford to the department an opportunity to select such a site as it may deem proper after a minute examination.

The following letter from Colonel Bomford contains an estimate of the expense, and the committee recommend that the blank in the bill be filled with that sum.

ORDNANCE DEPARTMENT,
Washington, 7th January, 1828.

SIR: In reference to the letter of the Hon. J. S. Johnston, of the Senate, of the 27th ult., and to the bill therein enclosed, relating to the erection of

an arsenal in Florida, which have been referred to this department, I have the honor to report—That the establishment of an arsenal contiguous to the Mexican Gulf frontier is considered necessary to the interests of the public service. A depot of military supplies in that quarter is requisite for supplying the troops in time of peace, and would be of the highest importance to the defence of that frontier in time of war.

This subject was presented for consideration in the annual report from this department, dated on the 27th of November last, and is printed among the documents which accompanied the President's message, at page 93, in document No. 2, to which I beg leave to refer, as it contains the reasons upon which the recommendation of the measure was founded.

An arsenal suitable for that section of the country, it is conceived, should consist of the following, viz. A site on navigable waters to contain from 80 to 100 acres of land; an arsenal for storing arms and artillery equipments, 30 by 100 feet, two stories high; a storehouse for packages in bulk, 30 by 80 feet, two stories high; a magazine for gunpowder and ammunition; officers' quarters, 25 by 38 feet; barracks for workmen, 25 by 50 feet; a gun house for preserving artillery carriages, 26 by 100; and three small workshops for repairing small arms, constructing artillery carriages, and preparing ammunition. A wharf and enclosures would also be required.

The department does not at this time possess the information necessary for forming an accurate estimate of the cost of such an establishment, but it is presumed that it could be erected for about fifty thousand dollars; and I would recommend filling the blank in the bill with that sum.

With respect to the form of the bill which was received with Mr. Johnston's letter, I beg leave to observe, that it appears to require that a site shall be *purchased*: this may be considered as precluding the right of selecting a site from any of the public lands. It is not known that a suitable site could be found on any of the public lands, but if such should be the case, it might be advantageous to have the privilege of occupying it. I would, therefore, suggest the expediency of substituting the word *procured*, for the word purchased, in the bill.

I have the honor to be, respectfully, &c.

GEO. BOMFORD,
Brevet Colonel on Ordnance Service.

The Hon. JAMES BARBOUR, *Secretary of War.*

DEPARTMENT OF WAR,

January 8, 1828.

SIR: In reply to your communication of the 27th ultimo, on the subject of erecting an arsenal in the Territory of Florida, I beg leave to refer to the enclosed report, upon that subject, of the officer in charge of the Ordnance Department.

I have the honor, &c.

JAMES BARBOUR.

Hon. JOSIAH S. JOHNSTON, *Senate.*

NAVY COMMISSIONERS' OFFICE,

February 16, 1828.

SIR: In reply to your letter of this day, the Commissioners of the Navy have to observe that, from the best information in their possession, there are twenty-one feet of water on the bar of Pensacola, and seventeen on that of St. Joseph. That nothing has occurred to induce them to believe that any other place can be found on the Gulf of Mexico, for a naval establishment, combining the same advantages as Pensacola.

Wherever navy yards are established, they think that batteries should be erected for their defence.

I am, very respectfully, sir,
Your obedient servant,
JNO. RODGERS.

Hon. JOS. M. WHITE, *Congress.*

Copy of a letter from Commodore Charles G. Ridgely, late commander of the West India squadron, to Col. White.

WASHINGTON, *January* 16, 1830.

DEAR SIR: I have your letter of yesterday before me, propounding questions relating to the policy of erecting fortifications at the entrance of the harbor of Pensacola, and whether, in my opinion, it should not be continued as a naval rendezvous for our squadrons in the West Indies and Gulf of Mexico, and as a depot for naval purposes, and its facilities as a watering place for shipping.

You further ask me to say whether the squadron lately under my command suffered from sickness at Pensacola, and whether the bar at the entrance at the harbor will not admit of being deepened so as to admit vessels of the largest class. To all of which I will endeavor to reply as succinctly as my very limited means will afford me.

In the first place, I am decidedly of the opinion that fortifications should be erected on San Rosa point, and on the opposite shore, called the Caulkey, of sufficient strength and magnitude to prevent the entrance, over the bar, and into the harbor, of an enemy's naval force not drawing more than twenty (20) feet water; more than that would make it extremely dangerous to attempt crossing, and more particularly so, as the only time when an enemy would make the attempt, must be when the winds are fair and strong, and at such times there is always a very heavy sea on; hence, they would inevitably strike, and the extreme hardness of the bottom would cause them serious and irreparable injury, (in that harbor,) even if they were successful in thumping over, and passing from beyond the reach of the fire of the batteries. There is twenty-two (22) feet water on the bar at all times. If it is increased at all, it is only when the very fresh and strong winds blow that would justify the attempt to enter, and hence the danger as I have stated. There is little or no rising of the tide on the bar: I have understood from those who have made many experiments, not more than three or four inches.

The incalculable advantages that would accrue to an enemy, capable of taking and holding Pensacola, and making it a rendezvous for a blockading squadron, stationed off the mouths of the Mississippi, will make it

obvious, at the first glance, of the great necessity of erecting fortifications sufficiently strong to deprive them of these advantages. The force of the batteries, and the manner of constructing them, is matter for the Engineer Department, and I am not prepared, on that question, to give an opinion.

The salubrity of Pensacola is as good as any portion of the globe I have been in; and when, from local causes, the yellow fever showed itself, and committed some ravages in 1826, not a single case of that disease, or of any other, (the effect of climate,) was produced on board the ships of the squadron: two ships had yellow fever on board, and a few deaths occurred. The causes, however, were easily traced; the one to a long and improper anchorage within the *inner* harbor of Key West, and the very great exposure of the men; the other from the necessity of lying a long time in the harbor of Vera Cruz.

That the bar can be deepened, I have not a doubt; but there are various opinions whether it would remain so, or fill up again in a short time. My own opinion inclines to the former; and I think the experiment a fair one, and should be made.

I have written this in great haste, and have not time to correct it either in matter or manner. You will therefore make every allowance, and believe me,

Your friend and servant,

CHARLES G. RIDGELY.

The Hon. JOSEPH M. WHITE.

Extract from pages 47, 48, *of Gen. Bernard's report.*

The description of the communication between the bay of Mobile and Lake Pontchartrain, given in a former subdivision of this report, (page 19 and following,) shows that, by improving the shallow Pass au Heron to the depth of eight or nine feet, the sound along that part of the coast will afford, at medium tide, a safe and convenient navigation between the bay and the lake, to sea vessels not drawing more than eight feet. Whilst these vessels can sail up the bay to the city of Mobile, and navigate Lake Pontchartrain, they will find a passage to the Mississippi through the sloop canal contemplated in the vicinity of New Orleans. Therefore, this city and that of Mobile, or, more emphatically, the rich valleys of Alabama and of the noble Mississippi, will become connected by a commodious and well protected communication, the length of which can be estimated at one hundred and sixty miles. A canal five miles long, at or near New Orleans, and the improvement of the Pass au Heron, will effect this important result.

But another, no less interesting, object would be the connexion of the bay of Mobile with that of Pensacola. Indeed, as to support, relief, and supply, in time of war, it is highly desirable that the latter bay, the only naval place of arms on the Gulf, should have a safe and commodious communication with Mobile, New Orleans, and the head of Lake Pontchartrain. Besides, such a communication might be deemed of great advantage to commerce, considering that Pensacola, on account of a greater depth of water than any of our harbors on the Gulf, will, perhaps, become,

in the course of time, the port of exportation for the State of Alabama, and that of importation of the East India produce destined to the States in communication with the Gulf.

Under these impressions, the board, when in Florida, have examined the country west of Mobile bay, with a view to ascertain the main facts upon which might be anticipated a connexion of the two bays by means of a sloop canal. The information derived from their excursion led them to hope that a water communication might be opened from the bay Bon Secour (in Mobile bay) to the Great Lagoon, at the entrance of Pensacola bay. The distance would be less than thirty miles.

Indeed, the country in this direction is very low, and several intervening natural channels would become of great assistance.

The bay Bon Secour, within four miles of the mouth of the river Bon Secour, affords a depth of nine feet; this depth lessens gradually in approaching the river, and on the bar, at the entrance of the latter, it is but three feet at low tide, and five and a half feet at high tide. The river is navigable for ten and a half miles up, but is winding on the first seven miles, and very narrow and crooked on the remainder, that is to say, three miles above Lacoste's plantation. By improving the mouth of the river at two or three places, this plantation might be assumed as the commencement of the canal. Hence, following the bed of the river for about half a mile, then its tributary, bayou Johnson, for about one-quarter of a mile, a cut of four miles would connect the latter bayou with bayou Portage. The ground is low and level. The route would then descend, for two miles, bayou Portage, whose depth is represented to be eight feet; hence, through the bay Lalande, which, on a distance of ten miles, affords from five to six feet depth, the crossing of the Perdido river would be about two miles in width; its depth is ten feet. The cut, to connect this river with Great Lagoon, would not be more than one or two miles through a level and low ground. From the end of this cut, at the head of Great Lagoon, to the entrance into the bay of Pensacola, the distance is said to be nine miles; the depth three feet at the shallowest places, and six feet at the deepest.

Those local informations, which accurate surveys alone might appropriate to the location of a line of communication, show, at least, that there is no insuperable difficulty to effect the connexion of the two bays; and it is to be added, that the termination of this navigable line into either bay will be rendered perfectly secure by means of the defensive works destined to defend the entrances of these bays.

Such are the main features of the navigation along the coast from the bay of Espiritu Santo to the head of Lake Pontchartrain, and the improvements, which seem to the board feasible and expedient.

We shall now submit some views in relation to the delta of the Mississippi.

Improvements through the delta of the Mississippi.

There is no State in the Union for which nature has done more than for Louisiana, in relation to water communication. Traversed by the Mississippi and Red rivers, provided with numerous and deep watercourses, well supplied at any season of the year; in fine, having a soil formed of fluviatic deposites through which water is met with at the depth of a few feet,

the State of Louisiana enjoys, to a high degree, all the requisites for a system of inland navigation.

A system of canals in Louisiana is not, however, to be limited to the object only of connecting all points with one another, and with the main arteries of exportation and importation; it must, besides, like at the mouths of the Nile, of the Rhine, the Meuse, and the Scheldt, be framed to guard the country against the havoc of inundation; to reclaim the tracts of land which, by their elevation, are susceptible of being drained into lower ground, and also to facilitate, by proper artificial means, the deposite of the rich water sediment on the marshy ground, and thus to create, in process of time, fertile and valuable land.

Such a system, framed with a view to connect together and fulfil all these important requisites, would not only be beneficial to the State of Louisiana, but would also add greatly to the value and quantity of public land in this quarter. Besides, nature having set geographical limits to the growing of certain products, the sugar land of Louisiana, by increasing in extent, would render our population still less dependent on foreign markets for an important article of general consumption.

Extract from page 45 to 52 of the report of General Bernard, upon the contemplated water communication from the Mississippi to Pensacola.

The bayou Manshac, or Iberville river, has formerly connected, in time of freshets, Lake Pontchartrain with the Mississippi; it leaves the latter at about 15 miles below Baton Rouge, and discharges itself into Lake Maurepas, out of which there is a natural channel leading to Lake Pontchartrain. During the last war the bayou had been obstructed at its end on the Mississippi, and afterwards solicitations were made to have it again opened. However, having become partially cleared, the plantations along its banks, as also the rear of those fronting on the Mississippi, were subject to be overflown in time of freshets; and, at the request of the inhabitants of the neighborhood, the bayou has been, in 1826, entirely and substantially shut up at its head on the Mississippi. Indeed, unless dykes should be erected on each bank of the bayou, with sluices to drain, during the warm season, the low ground, the opening of this channel would become much obnoxious to the plantations in its vicinity.

From the Mississippi to Lake Maurepas the distance through the meanderings of the bayou is, at the least, 55 miles; and from the entrance into Lake Maurepas to the head of Lake Pontchartrain the distance can be reckoned at 16 miles. At the junction of the bayou with the Mississippi, this river rises about 28 feet above the lowest stage, and the bottom of the bayou is about 13 feet above low water mark in the Mississippi. Therefore, as an outlet of discharge, the bayou might give passage to a column of water 15 feet high, and, as a navigable canal, boats could pass through it but during high stages of water in the Mississippi.

To use bayou Manshac as an outlet of discharge, it would become necessary to confine a portion of its channel within dykes, sufficiently raised to guard the neighboring land against inundation; and to procure a still water navigation at any stage of water in the Mississippi, it would be indispensable to lower its bottom, at its junction, by more than 13 feet, to erect a

guard lock at the opening, and other various works along the communication. However, by restricting the work to be executed to the erection of dykes, and the deepening of the bottom, the bayou would then afford a descending water navigation into Lake Pontchartrain, and, besides, assist the Mississippi in the discharge of its water. The head of the current would increase with the rise of the Mississippi; and, if taken into computation that the highest rise at New Orleans is 15 feet above the lowest stage in the river, and 15½ feet above low water mark in Lake Pontchartrain, whilst the highest rise at bayou Manshac is about 28 feet above low water in the Mississippi, it can be concluded that the greatest fall from the upper end of the bayou to Lake Pontchartrain cannot be less than 28 feet.

Such a communication would, no doubt, become interesting to the trade of Comite and Amite rivers, by providing a channel through which these rivers would be connected with the Mississippi and New Orleans; but a canal uniting the Mississippi and Lake Pontchartrain, at or in the vicinity of New Orleans, would procure almost similar advantages to this trade, which is, in the present state of things, in communication with Lake Pontchartrain, through Iberville river and Lake Maurepas. With respect to a general thoroughfare, it is to be remarked that, at medium tide, vessels drawing more than six feet cannot, through the outlet of Lake Maurepas, enter Lake Pontchartrain; therefore, a navigation directed to the sea by bayou Manshac would be less convenient than either through the Mississippi, down to its mouth, or through, in succession, the Mississippi, the canal contemplated at New Orleans, and the Pass Rigolets, which admits, at medium tide, vessels drawing 8 feet.

But if to the advantage of a thoroughfare is added that of assisting the Mississippi in the discharge of its water at the time of freshets, it can be concluded that the improvements which would make bayou Manshac fulfil these two objects would, as to commerce and security against inundation, highly deserve the national cares.

Indeed, the freshets in the Mississippi are observed to become higher than formerly, the ruptures of the dykes more frequent; hence the settled parts of lower Louisiana are more and more menaced of being overflown. Before the extension of settlements along the margin of the river, numerous issues and outlets were carrying to the sea a considerable volume of water, but the security of the establishments fronting the river has necessitated the erection of *levees* or dykes, which, by shutting up these outlets, and also straightening the bed of the Mississippi, have confined within a narrower channel the enormous mass of water which has to flow through it. This mass must, consequently, rise higher than formerly; and, as the progress of cultivation will more and more counteract the expansion of the river, it follows, that lower Louisiana has much to apprehend, in the course of time, from such unavoidable effect. Therefore, without entering into details too foreign to this report, it can be inferred, from this short view, that any improvement which could facilitate, in lower Louisiana, the discharge of the Mississippi, would avert impending calamities, and confer benefits on the States bordering upon the Mississippi.

With a view to the same objects, the board have been directed to examine the bayou Plaquemines. This bayou makes out of the Mississippi on the western side, and connects this river with bayou Teche through the Atchafalaya. The Mississippi at its junction with bayou Plaquemines, nearly opposite to bayou Manshac, rises about 28 feet in high freshets;

the bottom of the bayou is 22½ feet below high water mark, and 5½ feet above low stage in the river. The width is about 150 yards, but soon becomes, on an average, 60 yards, which width it retains down to its embranchment with bayou Jacob.

Bayou Plaquemines is navigable when the Mississippi has attained its medium rise; and, at high water, the current becomes very rapid, owing to the short distance between the head and the foot of the fall. The entrance of this channel into the Mississippi, being at a re-entering bend of the river, is liable to be obstructed by driftwood from the Mississippi. Therefore, this channel of navigation and of discharge is menaced of being shut up, to the great injury of lower Louisiana. To guard against so serious an accident, as also to render commodious, through the outlet of Plaquemines, a water communication between the Mississippi and bayou Teche, would require a steady observation of the facts connected with both objects; facts which would be obtained but by a long stay on the spot, and a close study of the river through its various stages.

With regard to La Fourche river, (about thirty-six miles lower down,) which might also be used as a channel of navigation and discharge, it would require much improvement to be fitted to that double purpose. The bottom of this river at its junction with the Mississippi, is about on a level with the low medium stage in the latter: and during the rise of the Mississippi, the river La Fourche affords a pretty convenient navigation to barges. However, at about the middle of its course, its bed is fast filling up: on a distance of about sixteen miles, the width and depth have already diminished by about one-third of what they formerly were. This obstruction is extending gradually; and being the result of a progressing growth of willows favoring the accumulation of fluviatic deposites, it cannot be removed but by digging the actual bed of the river, and extirpating the growth which menaces to stop the navigation.

By deepening, to a proper depth, the channel of La Fourche river, and raising along its margin the necessary dykes, this outlet would both assist the discharge of the Mississippi, and procure, at all times, a commodious communication to the Attakapas.

Such are the main outlets through which the surplus water of the Mississippi might disembogue laterally into the sea, and which could, besides, be used as navigable channels. These objects of internal improvement being of a nature to be not only highly important to lower Louisiana, but beneficial, also, to the States bordering upon the Mississippi, they might, at a future day, solicit the attention of the General Government. And it is under such impression that the board have submitted, in the present report, these few considerations on the delta of the Mississippi.

SUMMARY.

The coast on the Gulf of Mexico, between Tampa bay and Appalachie bay, cannot be approached by vessels drawing more than five feet; in this latter bay eight feet can be carried, at high tide, to St. Mark's. Besides, the ridge of the peninsula of Florida has a mean elevation of one hundred and fifty feet above the ocean, and its top does not offer, at any place, either natual reservoirs or heads of streams adequate to the supply of a

canal having very large dimensions. Therefore, a ship channel, destined to connect, through the peninsula, the Atlantic with the Gulf of Mexico, is not practicable.

The heads of Santa Fé river and of Black creek present to a canal for boats the best passage across the summit of the ridge. Natural reservoirs, in this vicinity, will supply the lockage at the dividing point, whilst it is anticipated that filtration from the ground wil keep replenished the trunk of the summit level.

In this direction, a canal from the fork of Black creek to the mouth of the Santa Fé would connect the St. John's with the Suwanee; therefore, the Atlantic with the Gulf. Such a canal would be about seventy-eight miles in length, and the ascent and descent together two hundred and fourteen feet.

But the Suwanee being much obstructed at its mouth, and having no harbor at its entrance into the Gulf, it will be expedient to continue the line of canal from the Santa Fé to the harbor of St. Mark's. The whole route, from the fork of Black creek to St. Mark s, or rather from tide water in Black creek to tide water in St. Mark's river, will be one hundred and sixty-eight miles long, and the ascent and descent together two hundred and twenty-four feet.

With a view to an uninterrupted inland navigation, parallel to the coast, from the Chesapeake to the head of St. John's river, it will be necessary to open a sloop canal from the harbor of St. Mary's to the St. John's.

Respecting the coasting navigation from St. Mark's to Lake Pontchartrain, it will be rendered secure, safe, and commodious, by means of the following improvements: 1st. A canal along Crooked creek, from Ochlochney river to a convenient point in St. George's sound; through this sound and the canal the Appalachicola will become connected with St. Mark's. 2dly. The clearing and deepening of the Santa Rosa sound, at the meeting of tides. 3dly. A canal from the bay of Pensacola to that of Mobile, through the Great Lagoon and the river Bon Secour. 4thly. The deepening of the Pass au Heron between the eastern point of Dauphin island and the main.

Lake Pontchartrain can be connected with the Mississippi by a canal, which has been projected, at or near New Orleans, and by bayou Manshac.

This bayou, the rivers Plaquemines and La Fourche, can be rendered navigable at any stage in the Mississippi; and they deserve consideration, as offering the only outlets through which, in time of freshets, the lower Mississippi might be relieved in the discharge of its waters.

All which is very respectfully submitted.

BERNARD, *Brigadier General,*
Member of the Board of Internal Improvement.

WILLIAM TELL POUSSIN,
Captain Topographical Engineers, Assistant to the Board.

WASHINGTON CITY, *February* 19, 1829.

NINETEENTH CONGRESS, SECOND SESSION.

HOUSE OF REPRESENTATIVES, *February* 3, 1827.

The Committee on Roads and Canals, who were instructed "to inquire into the expediency of making an appropriation for opening and improving the inland navigation from St. Mary's river to the Tortugas, and from Appalachicola river, through St. Andrew's bay, to Choctawhatchie, sufficient for steam navigation, in the Territory of Florida," report, in part:

That, among the objects of internal improvement submitted to the investigation of the committee, no one has been regarded as more interesting to the safety of the inland navigation of the United States, or more easy of execution, than the extension, where necessary, along the Atlantic seaboard, of such short canals across the peninsulas which now intercept that long contemplated navigation, as shall render it continuous and uniform throughout, so as to be, for vessels of suitable draught, secure in war from the depredations of a maritime foe, and in peace from the dangers of the sea along a hazardous coast.

In furtherance of this sentiment, the committee had designed to comprehend, in a general report, embracing many objects referred to them, a recommendation of a survey, with a view to the future removal of the obstructions of so much of this line as borders the Florida coast, and especially at that inconsiderable bar between Amelia island and the adjacent continent, which intercepts the inland approach from the bay of St. Mary's to the river St. John's. It is one of the shortest links in the chain of inland navigation, which, leading from Barnstable across the first northern obstruction in the above line to Buzzard's bay, may be conducted to the borders of the Mexican province of Texas.

The river St. John's, the committee are assured, affords at present, from its mouth, at the southern extremity of Amelia island, eight feet water as high up as Lake George, or for a distance of one hundred miles, and six feet water thence, for ——— miles, to Lake Monroe, near the centre of Cape Florida.

The shoal between Amelia island and the continent, one mile and a half in length, is reported to the committee to be covered with four feet water at high tide, and to be exposed at the ebb so as to be four feet above the adjacent navigable water, and, consequently, so elevated as to be impassable at any time by a vessel drawing more than four feet water. To deepen or cut around this shoal a six feet channel, would admit, from St. Mary's to the head of the river St. John's, a vessel drawing not more than six feet water.

So that, besides the short but essential link of an extensive chain of inland seaboard navigation which this short excavation will supply, it will, at the same time, perfect, for steamboats drawing less than six feet water, a secure passage from Charleston, in South Carolina, by Savannah, in Georgia, and St. Mary's, to the head of the river St. John's, and open to the purchasers of the unappropriated lands on both sides of that river, about to be offered at public sale, an access to those important markets for their future productions.

From such an improvement, which the committee are assured can be completed for ten thousand dollars, an appreciation of those lands to an

extent very greatly exceeding that sum may, therefore, be confidently expected.

Involving the exercise of an unquestionable power of the Federal Government over one of its Territories, being presented to the consideration of the committee by a resolution of the House, and a letter from the Delegate of Florida, addressed to the chairman of the committee, and making part of this report, accompanied by a map of a Spanish survey, a chart founded on an examination of the coast of Florida, by order of the Secretary of the Navy, and an extract from the letter of a gentleman reported to the committee to be a man of practical science, all of which render it easy to measure its probable cost, that cost being of inconsiderable amount, and to be incurred only after the previous examination and favorable report of the United States board of engineers; and the work, if practicable and successfully executed, being calculated as well to subserve the future interests of the United States in peace and war, as to enhance the value of very extensive tracts of public land about to be sold: the committee, referring to the accompanying evidence, and the advantages which the contemplated improvement promises to realize, have considered it expedient to report the accompanying bill.

WASHINGTON CITY, *December*, 1826.

SIR: A resolution which I had the honor to offer in the House of Representatives on the — instant, proposing an inquiry into the expediency of making an appropriation for opening and improving an inland water communication from St. Mary's to Cape Florida, and from Appalachicola, through St. Andrew's bay, to Choctawhatchie, was referred to the committee of which you are chairman.

I beg leave to submit, for the consideration of the committee, such suggestions as induced me to propose the inquiry, and which I trust will be considered of sufficient national importance to justify the inconsiderable expenditure that would be required. As both these objects are connected with the contemplated canal across the promontory of Florida, to connect the waters of the Gulf of Mexico and the Atlantic, the one being at its disemboguement on the Atlantic coast, and the other in the line of interior navigation along the coast of the Gulf to the Mississippi, a few preliminary remarks on the subject of that great national object may not be inappropriate or uninteresting.

The result of the preliminary surveys which have been made of the line of the Florida canal, is, in every respect, such as to justify the patronage extended to this work by Congress at the last session. It was evidently the sense of the National Legislature, that, while the proposed canal would, in its first operation, benefit the country through which it passed, open the public domain to rapid population, bring to a ready sale the public lands, and add to the aggregate of national wealth the products of a region probably not equalled in the United States in the number and variety of articles to whose growth it is adapted, it would, in its indirect operation, afford the most important facilities to the whole coasting trade of the Northern and Eastern States, and to the whole inland navigation of the Western waters.

It is in the highest degree gratifying to learn that a work of such singular, and, I may say, unexampled utility, is found, on survey, to be capable of being excavated on terms far within the general loose estimates which had been previously formed. There is every prospect that this all-important communication between the two great portions of the Union between the Atlantic and the Western waters, can be opened for a moderate sum, at the same time that the truest public economy would justify its being undertaken and executed even at the highest cost at which it has ever been estimated. A single supposition will prove the justice of this remark. Let us suppose that the hand of nature had already opened a communication by a deep navigable river, between the mouth of St. Mary's for instance, and that of the Suwanee, and that some foreign Power, being in possession of the Florida peninsula, should attempt to shut us out from the navigation of such a river, it is not too much to say that the attempt would be thought an adequate cause of war, and that the blood and treasure of this Union would be expended to any amount to force the enjoyment of such a passage. It cannot, then, but be admitted that an expenditure of one or two millions would be most profitably and economically made to construct an artificial communication, which, if already existing, it would be thought all-important to preserve, at whatever cost or sacrifice. It was a position often assumed by Mr. Jefferson, that the natural situation of Cuba gave to that island such an effective command of the navigation of the Gulf of Mexico and of the Mississippi, that they ought all to belong to a common jurisdiction; and that the possession of Cuba was, for this reason, an object which the United States ought never to loose from their sight, that this island was essential as the bulwark of our coastwise communication between the Atlantic and Western waters of the country. Mr. Jefferson went so far, a year or two before his decease, as to assure a gentleman, from whom I had the information, that it was with a view to this policy that he recommended the construction of gunboats. That their use for harbour defence, in a war with Great Britain, was not the main thing he had in view, which *was a descent on Cuba.* It wants but a moment's reflection on the character of Mr. Jefferson's policy, to understand that no motive of aggrandizement, or thirst for conquest could, in his mind, have lain at the bottom of these views. He regarded Cuba as a great fortress, standing midway on the route of our coastwise intercommunication, and at a point where nature has superadded so many obstacles to navigation, that even a feeble force entrenched at the Havana, might hold our whole trade in check in this quarter. Such a fortress, he saw and felt, ought, by the great law of self-preservation, to belong to the United States. Now, it is one of the most important views, which can be taken of the proposed canal across the Floridian peninsula, that it almost wholly destroys the power of Cuba, as a check over our trade. This canal would be of choice, the route of every vessel bound into or out of the Gulf of Mexico. Instead of passing ourselves along the shores of Cuba, all the foreign navigation, both of European Powers and the colonies, and of the new American republics, would prefer this passage to the difficult and dangerous navigation of those already existing by nature. The United States would, consequently, lay a very considerable portion of the commerce between America and Europe under direct contribution, in the form of the tolls which would justly be exacted for the passage of this canal, and which, as they would be adequate to all the expenses of its preservation and repair, would leave the free passage a gratuitous advantage of American vessels.

Such would be the importance of the canal, even in the present state of the neighboring regions. But when we look to the prospect of the opening of a canal through the isthmus of Central America, we immediately perceive other and most important bearings of the Florida canal on the public prosperity. When the two works are executed, they will constitute the two keys to the navigation from the Atlantic to the Pacific. The exclusive possession of the Florida canal will enable the United States to make terms for a free passage through the canal of Central America; because, if this be denied us, we can condemn every vessel bound to the Guatemalian, to stem the Gulf stream. The republics of Central America and of the United States, already on the most friendly footing, will be bound together by this new tie of a mutual interest. The Florida canal, therefore, will be of the utmost importance as the means of ensuring the United States every desirable privilege in any system of communication across the American isthmus to the Pacific; a communication which will unquestionably be burdened with heavy duties and tolls against all States not possessing such an offset. But, in addition to this, and on a wider view of the subject, the moment the isthmus shall be excavated, then will the Florida canal become the highway of the trade between Europe on the one side, and Asia on the other; and it is not too much to anticipate a change in the direction of the world's commerce, like that effected by the circumnavigation of the Cape of Good Hope.

Every subsidiary circumstance favors and co-operates with the execution of the main design. The deficiency of harbors, felt to a considerable degree in every part of the southern coast, has been regarded as one of the great obstacles to be contended with in perfecting a system of navigation like that now projected. It appears, however, from the researches of the engineers, that the bay of St. Joseph's, situated due north of Cape St. Blas, on the coast of West Florida, is perhaps the most valuable bay possessed by the United States, with the exception of that of Pensacola, south of Chesapeake bay. Of its two entrances, the eastern has at least a depth of twenty-two feet, and the western of thirty; and its position on the Florida coast is the most favorable that could be imagined in reference to the proposed line of communication from the great Western waters to the Atlantic.

The details of the interior surveys for the route of the canal across the peninsula, not being yet digested and reported to the department, are known only in the general result, which, as already stated, is in the highest degree favorable. Meantime, however, the surveys of St. Mary's, St. John's, the Atlantic coast of Florida to Boca Ratones, and the interior course of the St. John's up to Lake Monroe, lay open a field for internal navigation and intercourse of a magnitude and interest wholly unexpected.

Let us first consider the navigation of the St. John's, with its tributary streams, and the line of lakes which it connects with each other. This is truly a magnificent river. It preserves an average breadth of two miles for a hundred miles from its mouth, often spreading into lakes of four or five miles in width; its banks are covered with forests; it is navigable for large merchant vessels for a great distance, and for vessels of thirty tons as high as Lake George, and on the bar of that lake there is six feet water. Beyond this the water deepens, and it is navigable for vessels of the same size to its source; in other words, it admits a steamboat navigation as far south in the Territory as 28° 30′. Almost all the land through which it passes is public land; the growth of timber is pine, cypress, live

oak, and cedar, unequalled in quantity and quality in the United States. Whenever the lands are cleared, they become adapted to the culture of sugar, oranges, lemons, limes, almonds, olives, the gourd, rice, &c., according to the particular locality of the spot. All these articles have been, and at this moment are, produced in the Territory, and their culture is capable of indefinite extension. To lay open this region to convenient access, and make it contribute, in consequence, to the public and individual advantage, would require but little labor and expenditure to be bestowed in straightening and deepening the channel. An expense estimated at ten thousand dollars, in the opinion of competent judges, would completely open an inland tide navigation from 28° 30′, the head of the navigation of the St. John's, to Cape Roman, in South Carolina, in 38° 8′, bringing to the Atlantic markets from our own territory all the products which can be brought from the West Indies.

Nor is the facility for a secure line of inland navigation on the eastern coast of Florida less important to the immediate growth of the Territory itself, and the consequent advantage of the Union. From St. Mary's to St. John's, within Amelia island, a safe and convenient route already exists, with the aid of some inconsiderable improvement. A canal of seven miles in length would, by means of Pablo river and North river, connect the mouth of the St. John's with the harbor of St. Augustine. A second cut of six miles would open a communication from Matanza to Musquito, by means of the intermediate rivers and sounds. From Musquito to Indian river, a passage would be opened by a cut of one half mile. Thus, by three portions of canal, extending in the whole about thirteen and a half miles, a line of coast of 586 miles would be opened, to a safe and commodious inland communication from St. Mary's to Tortugas. The nature of the soil affords every facility for the works necessary for this object. The lines necessary to be opened pass through low grounds of a mean elevation of about seventeen inches above the tide water, and afford every facility for excavation, as they consist of marl, clay, sand, and vegetable deposite. It has been estimated that fifty thousand dollars would be more than sufficient to effect the whole work of opening this line of communication. The accomplishment, at so trifling an expense, of the project indicated, would extend our line of steamboat communication along the southern coast for near a thousand miles: and within reach, by a short passage, of the island of Cuba, the whole West Indian archipelago, the coasts of the Gulf of Mexico, and whatever passage may be opened to the Pacific.

The map of the globe may probably be searched in vain for a combination of similar natural advantages, requiring so little artificial aid to be turned to such a prolific account of private and public benefit. It is confidently hoped that Congress will pursue the course they promptly struck out last winter, and enter on the execution of these most auspicious operations, in which the national revenue, the sale of the public domain, the population of a territory, the opening of new markets of demand and supply, the security of our coastwise navigation in all its extent, and our *command* of large branches of commerce in which, hitherto, we have only *participated*, are but a portion of the great objects to be attained.

The map which I have the honor to enclose, will furnish the committee a more accurate idea of the localities of the country, than any description that could be given. It was made with a view of presenting each point, and is marked, in reference to them, in such a manner as to furnish

the most satisfactory information upon the first inspection. My predecessor, General Hernandez, who first introduced the subject of this interior navigation to the attention of our Government, has furnished me with a copy of a letter written to one of the departments here, several years ago, in which an interesting account is given of a captain in the Spanish service, who was sent by the Provincial Government with despatches to the Captain General of Cuba, in 1812, in a canoe, with four men, through those sounds and rivers, and occasionally at sea, from the mouth of one inlet to another, until he arrived at Cape Florida; and from thence through the keys is said to be a safe navigation to the Tortugas; and from that point to Cuba is only about sixty miles. This committee will also derive such information of this country from the interesting report of Colonel Gadsden, who was charged with the survey of the road from St. Augustine to Cape Florida. This line of communication, from the southern extremity of our continent to South Carolina, derives an additional importance from the contemplated connexion of Charleston harbor with the Dismal Swamp canal, which will furnish an interior passage, at a very trifling expense, to the seat of Government of the United States, and to all the points on our southern coast connected by their numerous rivers with this communication. If I may be permitted to anticipate the completion of this work, and to refer to the advantages it would secure, it promises results the most astonishing to those who never reflected on the subject, and develops the advantages we shall derive from the acquisition of that much neglected territory ceded to us in the late treaty with Spain. The island of Cuba, in its geographical extent, is very little greater than one of our largest States, and yet the exports of that island are about two-thirds of those of the whole twenty-four States. This great disproportion is in consequence of the greater value of their productions, in exchange or for market.

The Territory of Florida, which is capable of producing nearly all the articles of Cuba, has scarcely attracted, in five years which it has been in the possession of the United States, any attention, in consequence of the desolation occasioned by the invasion of 1812, from which it is but just now recovering. The unadjusted state of land titles, from the delays of our Government, the very limited information of its resources, and the want of this communication, by which its valuable productions could be carried from the southern extremity of the peninsula to Savannah and Charleston, and from those places to the Eastern cities, in their numerous and regular packet ships and merchant vessels, or to the centre of the Union, by means of the Dismal Swamp canal, as before alluded to.

There are annually gathered at St. Augustine about twelve hundred thousand oranges, and in the vicinity about three hundred thousand more; there are some trees supposed to be one hundred and twenty years old, which bear, at this time, four thousand oranges. This quantity does not supply the United States with one-twentieth part of the consumption of this valuable article of necessity as well as luxury, and we are compelled to depend on Portugal, Spain, Sicily, France, the West Indies, and South America, for this delicious fruit, as well as limes, lemons, citrons, and olives, when they can be cultivated in Florida in quantities sufficient to supply the whole demand of the United States. It is estimated that an orange grove of ten acres, which requires the attention of but two hands, will produce as much as a cotton or sugar plantation by the employment

and labor of forty. The inducements to such cultivation will soon stimulate the activity and enterprise of those who are not so wedded to old habits as to resist the impulses of interest and the convictions of reason. I need not mention to the committee the valuable staples of sugar, rice, indigo, and sea island or the long staple Bourbon cotton, the last of which is very little inferior to that of Brazil, and which is now cultivated extensively for a considerable distance from the seashore, on the Gulf and Atlantic side of the peninsula, and westward towards St. Mark's and Pensacola.

The rice lands of Carolina are now selling at two hundred dollars per acre, and those of Florida, equally well suited to the cultivation of that article, are selling at only two or three dollars; and it is supposed, by good agriculturists, that, in the vicinity of Indian river, the rice would not be inferior to that of Hispaniola. It has been ascertained that the tobacco of which cigars are manufactured in Havana, can be cultivated to great advantage in Florida, and yields more to the labor employed than any other cultivation. The quantity of cigars and tobacco imported into the United States is supposed to amount to about five millions of dollars annually; the whole of this sum might be saved to the country, by a course of policy that would make it the interest of planters to direct their attention to such objects.

There is no part of our continent so well adapted to the culture of the vine of every description, as Florida. On gravelly or sandy soil it is known the vine produces less fruit, but of better flavor. The vineyards in France are generally on an argillaceous soil, such as those of Montpelier and Bourdeaux, as well as many others, in Germany, Italy, Spain, and Portugal; and with the same kind of soil, and the same temperature of climate, we have reason to expect corresponding results.

There can be no doubt that the culture of silk, which has lately attracted public attention, and has been made the subject of congressional inquiry, can be as successfully carried on as that lucrative branch of manufacture and commerce is in the South of France or Spain.

Experiments have already been made, which demonstrate the adaptation of our climate to the growth of the mulberry tree, and practicability of producing the silkworm in as great abundance as they have it in Languedoc and Valencia. I will not, however, detain the committee with speculations upon the advantages of these fruitful subjects for public and individual enterprise; they are too obvious to escape attention, and have only been alluded to in connexion with the subject, to present a miniature view of the advantages the Government would derive from such a work. This channel would not only return to the public Treasury ten times the amount of the sum expended in improvement, in the increased value of the public lands suited to such valuable staples, but would open a fine field for enterprises of a different character. The fisheries at the Florida keys, the manufacture of salt, and wrecking, all of which are objects of great importance, are worthy of, and have received, the attention of our Government.

It will afford the means of transporting the live oak and other valuable timber to our navy yards, and to market, from every part of the coast of East Florida. Whether the ship canal shall enter the ocean at St. Augustine, St. John's, or St. Mary's, it will leave the whole coast, north and south of it, the bartering ground for the trade of the Mississippi. St. Augustine, which was pronounced by Mr. Volney the finest climate on the Continent, and Fernandina, will become great depots, and acquire a consequence which their natural and local positions give them elevated

claims to; and the public property in their vicinity will receive a corresponding improvement in value.

Upon the subject of the other branch of the resolution, which proposes an examination into the propriety of opening the communication between Appalachicola, through St. Andrew's bay, to Choctawhatchie, I beg to refer to a letter addressed, at the last session of Congress, to the Committee on Roads and Canals in the Senate, to be found among the printed documents of that body, for a detail of the situation of that country, which has become more interesting from its contiguity to St. Joseph's bay. A cut of two miles would unite the waters of the Appalachicola, which is navigable for steamboats several hundred miles, and St. Andrew's bay; and from thence to Choctawhatchie, another cut of four miles only would connect them together. From the point of connexion westward, through St. Rosa's bay and sound, by Pensacola, to within one half mile of Perdido, there is an open steamboat navigation: and from Perdido to Mobile bay, a cut of four miles further would make the whole communication open to New Orleans. It is believed that the whole work of excavation from the Mississippi to Appalachicola, being only about twelve miles, might be accomplished for one hundred thousand dollars, and the one the more immediate object of this inquiry, for about twenty thousand. The accomplishment of this work would open an interior steamboat navigation of about three hundred and fifty miles coastwise, in almost a direct line from the Mississippi to the Atlantic, which would be necessarily connected with the ship channel across the peninsula, which has not only attracted the attention, but enlisted the support of the ablest men of the Union—an object which claims pre-eminence of all others, for the purposes of universal national benefit, as a saving to the Government, as a source of incalculable profit to every commercial and agricultural citizen of this Union. It would save to the Government the annual naval appropriation for the suppression of piracy; it would save half the amount in transportation of naval and military stores; it would save thousands in the article of mail carrying: to merchants of the North it would save an annual loss of two millions of dollars arising from wrecks and pirates, beside the expenses of insurance: to the people of the West it would save the heavy loss they now incur by their unnatural trade of selling their produce at New Orleans, and buying their goods in the Atlantic cities, when their merchandise should be returned to them through the same channel in which their productions are transported to market. It would, in a word, shorten the dangerous navigation of four weeks, avoid the Scylla and Charybdis of the United States, and succor our exposed frontier in time of foreign invasion; give an outlet to our local commerce, and an inlet to our foreign, safe from the dangers of the sea and the perils of warfare; opening, by a cheap route, a ship, sloop, or steamboat navigation from the Atlantic to the Mississippi, that would bid defiance to the British navy, lessen our dependence on and solicitude about Cuba. These are some of the advantages of a work I have ventured to pronounce, in national importance, paramount to all others. To suppose that it will not, at a period not far distant, be accomplished, would be to suppose the nation hoodwinked, or destitute of that energy and enterprise that has produced its present glory, and the prospects of its perpetuity.

The improvements which are now proposed are subsidiary to the great object, and derive an importance in connexion with it; but, as local measures alone are deemed of sufficient consequence to justify the appropria-

tion, and are of infinitely more consequence, in a national point of view, than many improvements provided for in a bill which passed last year, "for improving certain harbors, and the navigation of certain rivers and creeks," &c.

If, in the opinion of the committee, preparatory surveys should be necessary, the engineers are now at the place, and could make them in a few days; and I trust that the bill now in the House of Representatives will be so modified and supported at this session, that provisions shall be made by law, for the survey between Pensacola and Mobile bays, which is a most important link in the chain of communication I have attempted hastily to describe, and for a more accurate knowledge of which I must refer to the report of the committee of the Senate of the last session.

The people of Alabama have too much intelligence and liberality to make any objections to the communication between Mobile and Pensacola bays. They must be sensible that the flourishing city of Mobile will command a considerable portion of the trade of the Mississippi in its transit to the Eastward, and will enjoy the benefits of a new traffic, in which, heretofore, they have never participated—the returning commerce from the Atlantic intended for the markets of the Western country, and particularly that which is destined for the upper parts of that rapidly increasing, enterprising, and respectable State.

In the distribution of the favors of the Government, I am sensible of the force and justice of the sentiment, that a wise and expanded policy should be pursued, and that appropriations should not have the appearance of greater local benefits in one quarter of the country than another; but when works of an exclusively national character are proposed, in which the whole Union are interested, where not only the facilities of commerce, the augmentation of the value of the public domain, the improvement of an infant Territory, belonging almost entirely to the Government of the United States, but where, also, the Treasury itself will be increased, rather than diminished, by the inconsiderable expenditure, it is confidently hoped that considerations of a local nature will not be permitted to have any influence on the present application. The small sums which have already been appropriated in Florida for roads, have, at the only public sale that has taken place in the Territory, been returned to the public Treasury in the increased price of the lands contiguous to them; and the twenty thousand dollars generously given at the last session of Congress for a survey of the canal will be returned threefold at the next sale, by competition of enterprising citizens, who have been attracted to the country from a belief that such improvements were practicable, and would be undertaken.

The improvement of the Territory is nothing more than an improvement of the property of the nation; and to neglect any means of promoting their prosperity, would be as unwise as for a parent to neglect the patrimony of his children during their minority.

It has been a part of the policy of every liberal and enlightened Government to promote its provinces and colonies; and we may hope that works combining such singular and pre-eminent advantages will be executed by the United States.

I have the honor to be, with high considerations of respect, your obedient servant,

JOS. M. WHITE.

Hon. CHARLES F. MERCER,
Chairman of Committee on Roads and Canals.

Extract of a letter from Z. Kingsley, Esq.

To obtain this great national as well as individual advantage, and lay all this part of Florida open to convenient inland navigation, would require only a trifling labor, in straightening the present crooked channel between St. Mary's and St. John's, and deepening the middle (which is dry at low water) about four feet; this would give eight feet at high water, in common tides; or, by cutting new channels of connexion through the marsh, between the creeks, amounting in all to about one and a half miles of excavation in length, which would have the same effect.

This work, if economically performed, would not, in my estimation, exceed ten thousand dollars, and would complete an entire inland tide navigation from latitude 28° 30′, the head of the navigation of the river St. John's, in Florida, to Cape Roman, in South Carolina, lat. 33° 8′.

Extract from the report of Captain Burch of the United States army, who was charged with the reconnoissance of the country between Mobile and Pensacola bays, by the Quartermaster General.

You will notice, on my sketch, the vestiges of a canal, marked as existing between bay John and the Little Lagoon near to Mobile point. This canal has never, to my knowledge, been spoken of before, or noticed by any one, and was shown to me by one of the old residents of the country, who informed me that there was no account or tradition whatever respecting it among the oldest inhabitants; so that it must refer itself for its history to some former period before the occupation of this continent by the present race of white inhabitants. The distance between the bay John and Little Lagoon, where this canal or ditch connected them, is about half a mile. The timber has grown up in it as large as elsewhere, and where it passed across the Black-jack ridge, the sand has nearly filled it up, though it is very plain even there; in the marsh on the margin of the bay John it is more plain; and in the Hammock, on the margin of the Lagoon, it is some five or six feet in depth. There could have been no object in such a canal, unless to connect the waters of Bon Secour with Perdido bay, for boat navigation; and I found it to be the opinion of those persons who have their cattle in that range, and know the country, that the Little Lagoon connects itself with the Crosstrees creek, and so forms the communication with the Perdido; and from the Perdido to the Grand Lagoon, (which is connected with Pensacola bay at Barrancas,) there is a low portage of two miles only.

It is almost inconceivable to those who are not personally acquainted with the country, how easily and at how little expense the waters of Mobile bay might be connected with those of Pensacola, for all purposes of steamboat navigation, and even for schooners of respectable size and burden; and I think that the facilities which would be obtained to commerce by such a communication will, before many years, cause its being carried into effect.

I am, sir, with perfect respect,
Your most obedient servant,
DANIEL E. BURCH,
Assistant Quartermaster.

To Brig. Gen. THOMAS S. JESUP,
Quartermaster General U. S. A., Washington City, D. C.